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USEFUL RECEIPTS.

Watchmaker's Oil.

The best oil for diminishing friction in deliacte machinery, is that which is entirely deprived of every species of acid, and of mucilage, and is capable of enduring intense cold without congealing. The oil, in fact, should be pure elaine, without any trace of stearine.

Now, it is not difficult to extract the elaine from all fixed oils, and even those from seeds by the process of Chevreul, which consists in treating the oil with seven or eight times its weight of alcohol almost boiling hot, decanting the liquid, and exposing it to cold. The stearine will then separate in the form of a crystalline precipitate. The alcoholic solution is then to be evaporated to a fifth of its volume. What is left is the elaine, which ought to be colorless, insipid, almost without smell, without any action on the infusion of turnsole having the consistence of white olive oil, and with difficulty coagulable.

Another method of obtaining elaine, more simple and exact than the former, is that adopted by M. Bracconol, which is to squeeze tallow between the folds of very porous paper, by which the elaine is absorbed, while the stearine remains. The paper being afterwards soaked in water, and pressed, yields up its oily impregnation.

In the "Annales de Chimie," March, 1823, another mode of obtaining elaine is given by M. Peelet, to which a preference over both the former processes is given on account of the facility with which it may be procured in quantity. It is as follows:—Pour upon oil a concentrated solution of caustic soda; stir the mixture, heat it slightly to separate the elaine from the soap of the stearine; pour it on a cloth, and then separate by decantation the elaine from the excess of alkaline solution.

Cure for Rattle-Snake Bite.

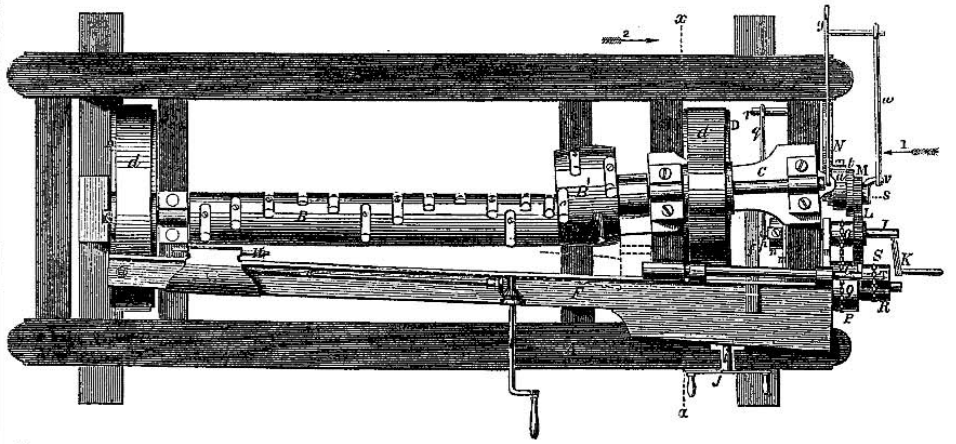
Dr. Blackburn, of Flat Shoals, Geo., in a letter to the "Northern Lancet, gives an account of the cure of the bite of a rattlesnake in a negro female eight hours after the bite was inflicted. The cure was effected by giving her an abundance of corn whiskey. This is the fourth case, he states, of bites by poisonous reptiles which have been cured by him with the use of the same remedy. He has perfect confidence in the cure, as he considered this negress to be in a moribund condition when he administered the whiskey.

Saleratus is said to be injurious to the human system, and that it destroys thousands of children and some adults every year. In New Brunswick, contiguous to Maine, the physicians are wont to say that half the children are killed by the use of saleratus. The evil is fast spreading throughout the Union. Families of moderate size already use from ten to twenty-five pounds of saleratus yearly. —[Ex.

[What do they do with it; eat it like candy, eh?

Want of care does more damage than want of knowledge, but both together is destruction.

SPOKE MACHINE.---TURNING IRREGULAR FORMS.---Figure 1.

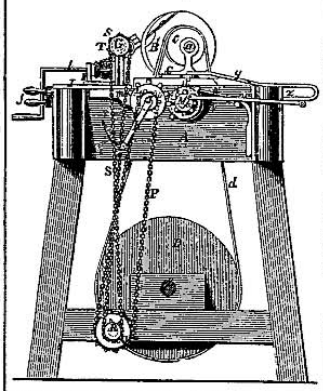


The annexed engravings are views of machinery, for which a patent was granted to Benj. F. Jenkins and Luke L. Knight, on the 4th of last January.

Figure 1 is a plan or top view of a turning lathe, with the improvements; figure 2 is an end view, and figure 3 is a transverse vertical section in the line, x x, fig. 1, looking at arrow 2. The same letters of reference indicates like parts.

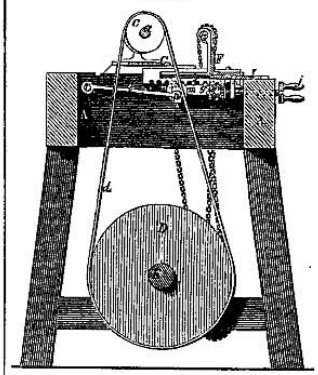
This invention relates to that description of turning lathe, in which both the work and cutters revolve, and the irregularity of form is produced by the vibration of the axis of the work, and the whole or part of the cutters; the improvements relate to a simple and effective means of controlling the vibrations of said axes. A is the frame which supports the working parts; B B' are two cutting cylinders; the one, B, has its axis hung in fixed bearings, but the other, B', has a shaft, a, hung

Fig. 2.



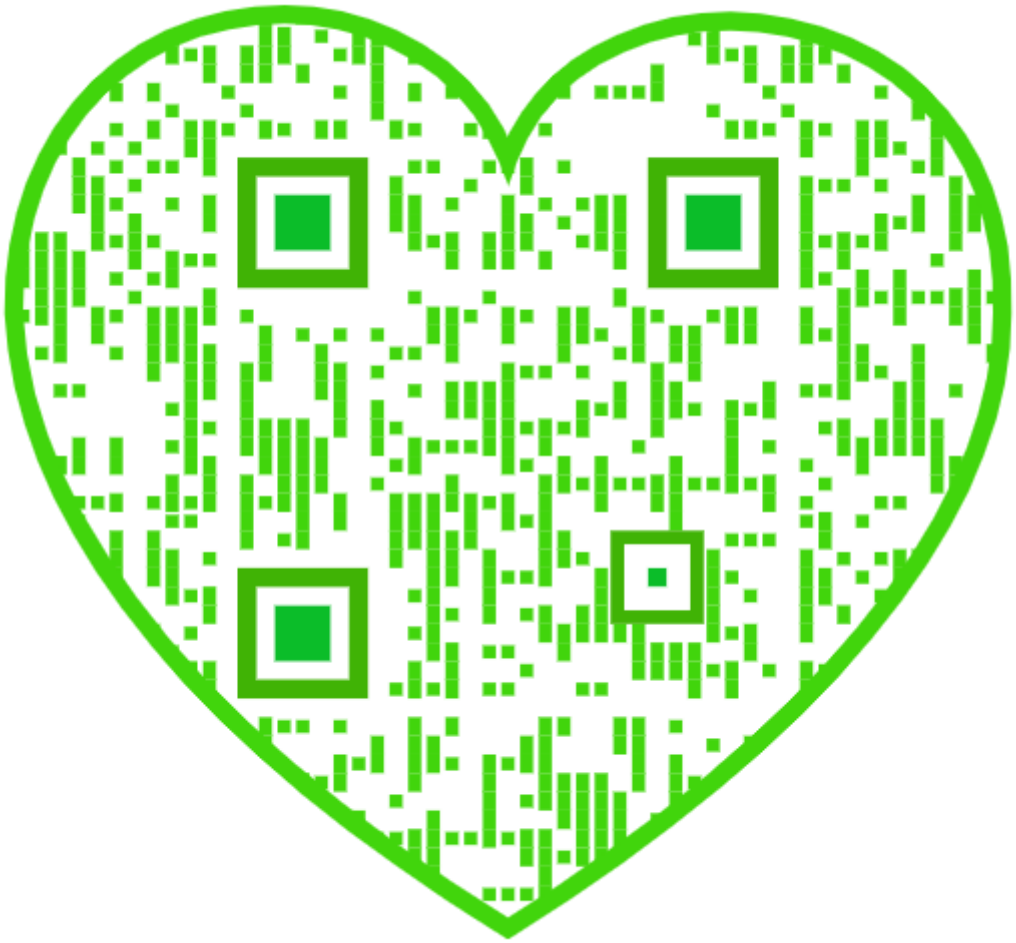
in bearings in a head, C, which vibrates from a centre, b, on the frame. The shaft of each cutter cylinder is provided with a pulley, c, which is moved by the band, d, passing over pulley, D, on shaft E. There is a work carriage, F, having suitable heads to carry the revolving mandril, G, and the movable puppet centre, H. This carriage rests on bedplate I, and is attached to it by a pivot, e, at one end, the other end being adjustable on the bed-plate by the rack, f, and pinion, g (fig 3) on shaft h; this shaft gears with a short shaft, z, whose end projects through the front of the frame, and has a handle, j, for turning it. The bed-plate, I, is pivotted near the end of the carriage, to the frame; the head of poppet H is adjusted by a screw, k, which is geared by bevel gearing to spindle l, which has a crank handle for the operator. The work carriage receives its vibrating motion through a shaft, J, which is fitted to turn in bearings in arms, m, attached below bed-plate, I. The said shaft carries a disc, n, on whose face there is an adjustable stud, p, which, by being set at different distances from the axis, will form a crank of varying throw. Stud p, is connected by a rod q, to a stud, v, fixed in the frame. By turning shaft J, with crank handle K, said shaft moves towards and from stud, v, and with it the bed, I, and carriage, F. The bed, I, is kept in a horizontal position, consequently the work carriage vibrates horizontally towards and from the cutter cylinders, whose axes are in the same horizontal plane as that of mandril, G, and poppet centre, H. On shaft, J, is a wheel, L, with teeth only half around it; on a fixed axis, S, is a toothed wheel, M, of half the diameter of L, but with the same number of teeth (placed on its whole periphery). The wheel, L, gives motion to

Fig. 3.



M, giving one revolution while the teeth are in gear, and causing it to remain motionless while the one half of L is revolving. The wheel, M, is eccentric to its axis, in order to make it continue in gear with L. While the shaft, J, is moving horizontally, it is attached to an adjustable disc, t, attached to disc, u, which is concentric to the axis, and its eccentricity must always correspond with that of stud p. On the outside of the hub wheel, M, is an eccentric pin, v, which is the equivalent of a crank; to this pin a rod, w, connects a rod, y, attached to the end of head C, the said rod having a guide pin, z, working in a guide in the frame, and which keeps it in place. At the back of disc, u, a spring catch, N, catches in a notch in the hub, and holds the disc so that it will not revolve after the teeth of wheel, L, pass wheel M; but the notch is so formed that it will throw the catch out when power is applied to wheel M, to turn it.

The stuff from which the spoke is to be cut, is shown in dotted lines between the centres; it is caused to revolve by turning shaft J, on which there is a sprocket wheel, O, which communicates motion through a chain, P, to a like wheel (Q), but of double diameter, on a stud near the lower part of the frame. There is another sprocket wheel, R, attached to Q, which gives motion by a chain, S, to wheel T, of the same size, on the mandrel, G. The shaft, E, receives rotary motion from any prime mover (two horse-power is sufficient to drive the machine, and it requires only one person to attend it), at such a speed as will give a high velocity to the cutter cylinders. The piece of stuff for a spoke is placed between the centres and secured; the work carriage, F, is brought to its proper position upon the bed-plate, I, to bring the rough stick up to the cutters. The operator then commences to turn the handle, K, slowly, in the direction of the arrow (fig. 2), giving the shaft, J, two entire revolutions, which, owing to the relative sizes of the sprocket wheels, give the work only one revolution. The eccentric stud, p, causes the work carriage to vibrate twice during the said operations—towards and from the cutter cylinders; the wheels, L M, and rods, w y, raise the vibrating cutter cylinder, B', to vibrate back and forth twice towards the work, but to rest for a short interval each time it is in its furthest position from the axis of the work. The studs, p and v, are so arranged in relation to each other, as to make the vibrating cutting cylinder and work carriage advance towards each other, and arrive at their nearest position to one another simultaneously; but as the cylinder makes its movement in half the time of the work carriage, it commences to move after and finishes moving before it. At the time when the axis of cylinder B' is stationary; between its vibrations, one of the narrow sides of the spoke near the tennon is being cut by it, the work carriage then, making the last half of one vibration backward, and the first half of the next vibration forward. When the axis of B' is moving towards and from the carriage, one of the broad sides of the spoke is cut; the carriage at that time makes the latter half of the forward and the first part of the next vibration backward. As the carriage and vibrating cylinder move towards and from each other twice during every revolution of the spoke, that part of the spoke with which the cylinder comes in contact, will have the form in transverse section of a four sided figure; the remaining portion of the spoke cut by cy-



linder, B, will be of elliptical form. By changing the proportions between the wheels L and M, and O and Q, and al ering the relative positions of the studs p and v, the vibrations ot the carriage and cylinder, and the revolution of the work may be so controlled as to produce sections of any desired form, varying throughout the length of the work. One good operator can turn out 200 spokes per hour with this machine. It works without a pattern, and will turn spokes, picks and straight oval handles, of various kinds. It can be altered quickly to turn long and short spokes, it occupies but little room—the frame is less than three by six feet; it is simple, and easily kept in order. The patent is now owned by M. Schoonmaker, and James M. Cooper, Kingston, Ulster Co., N. Y., from whom more information will be obtained by letter addressed to them at said place.

THE CRYSTAL PALACE

Opening of the Crystal Palace.

The ceremonies of the inauguration of the Crystal Palace were celebrated with great pomp on the 14th inst., in presence of the Chief Magistrate, several members of his Cabinet and a large number of exhibitors, and invited guests. When the London Exhibition was opened on the first day of May, 1851, Her Majesty, Queen Victoria, accompanied by the Royal Family, and foreign guests, left Buckingham Palace, and proceeded in state to the Exhibition Building, and entered it at precisely at 12 o'clock; she ascended the platform and took her seat upon the Chair of State, and the National Anthem was then sung. After its conclusion, Prince Albert read to his Royal Consort a short report of the proceedings, which he then delivered to her, together with a catalogue of the articles to be exhibited. Her Majesty returned a gracious answer, which was handed to her by one of the State Secretaries, and his Royal Highness, then took his seat by her side. Some dozen or more of the *corps diplomatique* then read an address on behalf of foreign nations; after a prayer by the Archbishop of Canterbury "in his archiepiscopal robes," and other ceremonies, the Queen declared "the Exhibition opened;" a flourish of trumpets and the firing of a salute and the cheers of thousands within and without the building, announced the realization of the noble idea.

These gorgeous ceremonies were deemed necessary to lend prestige to the Exhibition—it was in harmony with the ideas of "splendid governments," where tinselry and superficial ornament is employed to awe the loyal subject. It was an affair grand and magnificent in every respect, and so far as the exhibition was concerned—it being tre first of the kind—it honored Great Britain above any one single act she ever performed. The programme of the New York Exhibition was in some measure a copy ot the origiral.

The President of the United States, who left Washington by special invitation to be present at the opening of the Exhibition, was received at Castle Garden at 10 A. M., by the Mayor and Common Council of New York, together with a great number of distinguished men—the Mayor welcoming him in a few very appropriate remarks, to which the President replied in a very eloquent speech of considerable length. A procession was then formed, mostly of the military, and proceeded up Broadway towards the Crystal Palace, whsre it arrived at 2 P. M., and "amid the crash of drums and haut-boys playing," the President and his guard of honor entered and ascended to the platform appointed for him on the "North Nave" ot the building; he was enthusiastically cheered as he was received by the President of the Crystal Palace Association, Theodore Sedgwick, Esq., and other notables; Bishop Wainwright, in his clerical robes, then read a somewhat long but very beautiful prayer, after which Mr. Sedgwick made a very chaste and appropriate speech, to which the President replied briefly, but well and happily. The prayer was well delivered—excellently;—the Bishop is a portly gentleman of imposing appearance. Theodore Sedgwick is a capital speaker, and is withal a fine looking man. The President is a graceful orator, and a forcible speaker; he appears to have the rare gift of knowing what to say, how to say it, and when to stop. The exercises of opening were not tedious—they occupied only about three-fourths of an hour; but waiting three mortal hours for them to commence was enough to try the patience of Job.

There were many things connected with the opening which deserved praise, and others as deserving of censure. On the platform of the North Nave were seats appropriated for the President and the members of his Cabinet who were present,—Jefferson Davis, Secretary of War; James Guthrie, Secretary of the Navy, and Caleb Cushing, Attorney General; Senators, officers of the army (Scott and Wool were present), and navy (the veteran Stewart was there), Governors of various States (Seymour of New York, Cobb of Georgia, and Fort of New Jersey), Foreign Commissioners, &c. &c. On the East platform were the members of the press, clergy, foreign Consuls, a number of epauletted men, of station unknown, Judiciary ot New York, Presidents of Colleges, &c. &c.: these were invited guests; the holders of tickets were situated in the various galleries and throughout the building. There were, we suppose, about four thousand persons present, and while marked respect was paid to soldiers, politicians, and men of literature, the classes whose genius and skill the building itself is a monument of, were not mentioned in the programme, and were left unnoticed as persons of no consequence; Paxton, the designer of the London Crystal Palace, was on the platform at its opening—a marked man. Where were the designers of the New York Crystal Palace? No where, we suppose, for all that was said or known of them. No place was appointed for distinguished American engineers—the very men who should have held the most distinguished places,—next at least to the President and his Cabinet. It is a solemn fact, that for all the compliments which are sometimes extorted from public speakers, respecting what men ot inventive genius have done for the world,—the Crystal Palace being their Museum, and nothing else—our public men have not yet learned how to treat them; they never have, on any public occasion, been placed in their true position. We really expected that the opening of the Crystal Palace would have been an occasion for a marked compliment paid to men whose works will make it all that it is or can be. A separate platform should have been appointed for celebrated architects, engineers, and inventors; they should have been the most marked men there. Instead of this, there were epauletted unknown pompous speechifiers, reverend divines, and members of the press, in abundance (all invited guests), and their places distinctly mentioned by name in the programme, but there was no place for the Designers of the Crystal Palace, Messrs. Carstensen & Gilderstein, the engineer, Mr. Detmold, and other engineers connected with the construction of the building; or such inventors as James Bogardus, R. Hoe, McCormick, Mott, Bigelow, Babbitt, Sickles, Stillman, Allen, and a host of other American inventors that we could name, who have made their country great at home, and respected and admired abroad. These are the kind of men whom the people should delight to honor on such occasions. Those distinguished Americans who received Council Medals at the World's Fair in London, should have been invited and placed prominent by themselves, along with the designer and owners of the Yacht America; we should like to have seen them all together, with the famous lock opener—the inimitable Hobbs—on the right, cool as when he opened the famous 'Bramah Lock,' and bore off the brilliant prize of $1000—that would have been a sight worth viewing.

Our country is not yet republican in spirit; it is only so in name, and the opening of the Crystal Palace afforded full proot of the truth of what we say. It is a political aristocracy: petty squires, second-rate lawyers, caponlined Aldermen, hairy-faced men with epaulettes on their shoulders, and such-like characters, were treated with "come up here, there are chief seats for you." Distinguished inventors, artists, engineers, and mechanicians—the men who should have been most prominent—were treated with "sit down there—see there are some footstools for you."

Public conduct must and shall undergo a change in the treatment of our distinguished inventors, mechanicians, &c., if we can exercise any influence in bringing about such a reform. All our public displays—processions upon great occasions—have always ignored mechanical skill and industry; this should not be,—and such an event as the opening of the Crystal Palace afforded a most excellent opportunity, if the least quantum of common sense had been exercised, to pay a deserved tribute of respect to the genius and skill of our country, in the persons of some of her distinguished inventors and men of genius.

The building, as we said on one occasion before, "rises like a thing of beauty;" outside it looks beautiful, but not imposing in its dimensions, owing to its peculiar form; its quadrangles afford a view of but a small part of it at once. Inside it is still less imposing in dimensions, from the very same reason, and the numerous girders, braces, and tie-rods, which intersect the roofs of the four transepts—misnamed "Naves" by many. The dome which crowns the center is the chief beauty of the structure; and we cannot help but lament that the plan of making the whole building in a circle was not adopted, for then every spectator on entering would have had a more extensive view, and every mind would have been more deeply impressed with the idea of massive proportions. The decorations look very well, only a little too much of the "calico" about them—but they will not be finished for some time yet. It will be a month at least before all the arrangements of the Exhibition will be completed. Not one fourth of the boxes were unpacked on the day of opening; still there was much to admire and afford gratification. There are some fine marble statues by Italian artists, but the figures being mostly nude, we saw they were avoided by our American females. We will speak of these on some other occasion; at present we intend merely to chronicle and make some remarks on the opening of the Exhibition. We cannot, however, pass over mentioning some of the most conspicuous objects: on the floor, in the centre of the Nave stands a huge equestrian statue of Washington, by an Italian artist, we believe, named Marrochetti; it is of all other things the most striking to a connoisseur, inasmuch as Washington looks stiff and clumsy, and his horse not unlike that of a well-fed London brewer's; Washington was sedate and dignified, but bulk does not make a man look dignified, nor stiffness give him a commanding appearance; Washington was a fine horseman, full of agility, and liked to ride a horse of some metal. This statue, however, stands in the only place adapted for it. There is also a statue of Webster on the east side of the Nave; he is not on horseback, however, but stands with a great coat on, lifting his right hand,—not like Webster, but like some frothy orator, who had adopted this method of clearing points of faith, with the addition of thumping to keep warm in cold weather. It is by an English artist named Carew, perhaps a descendant of Bamfield Moore Carew, the gipsey. Mr. Sedgwick alluded to this statue in speaking of Webster, but the work is horrible; if the artist had copied the head from that of a small bust of Parian mable, in the English department, he would have succeeded better. There are large casts of the Savior and the Twelve Apostles, by Thorwaldstein, on one side, and high in merit above all others, is the bronze equestrian statue, by Kiss, of the Queen of the Amazons attacked by a lion. This single work of art is worth going a thousand miles to see,—but enough of this for the present.

We cannot predict what our countrymen are going to do in competition with the artists and mechanicians of other lands. England has about as much room appropriated to her as the United States, and is, we think, going to make a figure, but we cannot say much about any department yet; that of the United States in the north-east wing, is very backward. The Italian and German divisions are the most advanced; that of France will no doubt be exceedingly attractive, perhaps the most so of any. It is our opinion, from what we have seen, that the Exhibition will be a good one in many respects; we hope and believe it will yet come up to a very high standard, and a little just criticism will effect its proper share of good.

The superintendants and officers of the Exhibition were gentlemanly in their attentions, and deserve great praise. All passed off with great eclat. We shall have considerable to say every week after this, respecting the articles on exhibition, dealing with all in a spirit of fairness and candor.

THE DINNER.—On the evening of the 15th a grand complimentary dinner was given by the directors of the exhibition, to the President of the United States, his cabinet who were present, and the Commissioners from foreign nations. It was given at the Metropolitan Hall, and was a tolerable affair. There were about five hundred guests and among the *distinguished* persons present, so named by the daily papers, were Judge This, and General That, the Rev. Mr. This, and the Hon. That, but not the name ot a distinguished man of Science (except Sir Charles Lyell) an engineer, or inventor, whose names should have been most prominent. When will the world learn to distinguish between real and *dubbed* honor.

After Dinner Mr. Sedgwick made an excellent speech—an introductory one, in which he paid worthy compliments to President Pierce, the foreign Commissioners, and the "American Press, but said not a word about the inventors and artists of our country. The President happily replied to this speech and the toast to himself. The next three toasts were complimentary to the Secretaries Guthrie and Davis, and Attorney-General Cushing, to which these gentlemen replied as they can, ably and well. The next toast was to the press. In proposing it, Mr. Sedgwick said, "I am delighted to proclaim the fact, that there was not a single dollar of black mail sought by the American press." This was intended to be complimentary, as he said, "they treated the question solely on its own merits." We, however, must say that the distinguished foreigners present might have inferred from these very remarks, that it was customary for the American press to levy black mail. The American press is above such conduct; some mea. and contemptible papers may do so, but they are not the American press, any more than the midnight marauders in our land are the American people. The American press has no superior in the world for honor, intelligence, and real worth. Mr. Raymond, of the "New York Daily Times" was called upon to reply, and he at once saw and noticed the injurious allusion to the black mail, and replied to it like a gentleman and good representative of the American press, for which he has our thanks. He said "he did not feel specially flattered by the allusion to black mail, and he was sure that Mr. Sedgwick had never known an instance on any occasion, in which any respectable portion of the American press, or of any other press, had demanded payment for the statement of important facts, or for advocating great measures demanded for the public good."

The great and most appropriate speech of the evening, however, was that of Sir Charles Lyell, in reply to the toast of the Foreign Commissioners. He did not overlook the honor due to American inventors and men of genius, he knew and felt who the deserving were, he having won his own honors in the paths of science, and in the propagation of useful information.

STOCK FALLING.—Stock of the Crystal Palace Association sold at the board of brokers, the second day after the opening, at 10 per cent. less than the day before that great event. What is in the wind now? did not the thing look as well to the Wall-street clique for big dividends as was expected?

The "Tribune" says the Directors of the Association contemplate reducing the price of season tickets from ten to five dollars, a reduction we hope to see adopted. We would also suggest that if the price of a single admission were reduced in the same ratio, *i. e.*, to 25 cents, the receipts would be larger, and the public better satisfied, besides it would render thousands an opportunity of visiting it who cannot afford to pay 50 cents.

(For the Scientific American.)
Atmospheric Telegraph.

I perceive you notice with favor a scheme for an Atmospheric Telegraph. and hoping to see the undertaking successful I would call your attention to a few facts connected with past experience on a kindred subject, viz., the Asmospheric Railway.

In November, 1843, I think, the Dalkeny Branch of the Dublin and Kingstown Railway, in Ireland, was opened and worked successfully, a speed of 50 miles per hour having been obtained with a train of 30 tons. In this case the vacuum tube was 15 inches in diameter, and was about 1 3-4 miles long, and instead of being "accurately bored out and fitted perfectly straight," as a correspondent of yours asserts to be necessary, it was not bored out at all, and curves of 700 feet radius were turned without trouble. The manner in which the interior of the tube was lined so as to render it air-tight, is described as follows:—"Before being laid, the pipe which is not bored, is heated at each end, and received a certain quantity of tallow, it is then subjected to a rotary movement, while the workmen spread and regulate the lining. The piston is suspended in such a manner that the friction is equal over its whole circumference, and the frequent use of the piston diffuses the tallow in the best manner on the interior of the pipe, and it is remarkable that ultimately the piston did not carry away one particle of it." The piston used appears to have been precisely the same as Richardson's, and is described as follows:—"It consists of a disc about an inch less in diameter than the tube, and an expanding cup leather, intended to close the intervening space by the pressure of the air behind it." Now, if a heavy piston, strong enough to do the work this was represented to do, could be made to work satisfactorily in a tube so constructed, a light one that would have comparately nothing to do, might certainly be made to operate successfully; if so, an enormous expense would be saved over one that would have to be bored. As you said, "it is not necessary that a perfect vacuum should be formed in the tube;" it was found that a vacuum of 24 inches of mercury, equal to about 12 5 lbs. to the inch, was all that could be obtained. It seems to me that the check plates in Mr. Richardson's arrangement would have to be self acting, for with the piston moving at the rate of 100 or 200 miles per hour, it would be impossible to tell at what moment it would arrive at an intermediate station. I should think there was some mistake about the expense of laying down a mile of telegraph, as that length of cast-iron pipe 8 inches in diameter, and 3-8ths of an inch thick, would cost more than $3. A full description of the Dalkey and Kingston Railway, is given in the "Practical Mechanic and Engineer's Magazine," Vol. 3, first series.

Yours, respectfully, D. C. EDMANDS.
Lawrence, Mass., July 12, 183.

The Heat of the Human Body and Atmospheric Temperature.

A correspondent of the Washington Intelligencer, referring to the heat of the last week in June says:—

Dr. Franklin was the first, in 1750, to remark an atmospheric temperature above that of blood, and to notice the power of the human body to retain its temperature while all inanimate substances grew steadily warmer. President Madison, of William and Mary College in Virginia, in 1779, gives the following curious remark and quotation:—

"I do not recollect ever to have seen the thermometer here at more than 95, though Dr. Franklin mentions that in June 1770. it stood at 100 in the shade at Philadelphia when he observes:—

'I expected that the natural heat of the body (96) added to the heat of the air (100) should jointly have created or produced a much greater degree of heat in the body; but the fact was, my body never grew so hot as the air that surrounded it, or the inanimate bodies immersed in the same; for I remember well that the desk, when I laid my arm on it, the chair, when I sat down on it, all felt exceedingly warm to me, as if they had been warmed before the fire. And I supposed a dead body would have acquired the same temperature of the air, though a living one, by continual sweating, and by the evaporation of that sweat, was kept cold.'

I have been more particular in transcribing this passage from the works of this philosopher, as it certainly shows for whom the merit of certain late discoveries, which have made so much noise in the philosophical world, most justly belongs. I mean that power which the human as well as all animate bodies have of counteracting the heat of an atmosphere in which they are placed.—For what do all experimen's upon heated rooms evince further than had before been published by the doctor? It is thus that Franklin sitting in his chair, like Newton, reasoning on the figure of the earth, could show what costs others infinite labor and fatigue."

[The temperature of an adult is 99·5° (not 96°,) and we are convinced that the heat of the blood in the lungs, after the expulsion of the carbonic acid, is considerable above this. The reason why perspiration or evaporation keeps the surface of the body cool is not given in the above; those *late discoveries* which have made such a noise in the world spoken of above presents us with a reason. That evaporation would cool a body, is a fact which has been known to inhabitants of warm countries for a thousand years; acting upon this principle they spread a wet cloth over a porous vessel containing water, and by the rapid evaporation of moisture from the cloth, the water in the vessel is cooled down several degrees.

BANBURY, Eng., June 23, 1853.

MESSRS. EDITORS—I am a subscriber to your valuable journal, which is fast superadding an European to its American reputation. I always look forward to its weekly arrival as to an intellectual feast, and cannot speak too highly of its reports on the inventions of the day, of which so bounteous a crop now reaches us from your side of the Atlantic, that we can well afford to let your criticism sift the wheat from the tares—and yet marvel at the fertility of the soil which produces them in such abundance.

I was much pleased to find that you deemed my "Digging Machine" worthy of a place in your paper,—those machines are now at work in this country on all kinds of land, and are found particularly useful on the stiff soils, which has been found too expensive to submit to deep cultivation by the old methods. The Australian's have begun already to look after it, and I believe it would also prove of great service with you, more especially in bringing up the subsoil on the worn out plantations of the Old Dominion, indeed I am somewhat surprised that I have not yet heard from any of your intelligent mechanics on the subject.

My principal object in addressing you now, next to thanking you for the gratification which your publication generally, and your notice of my Digger in particular have afforded me, is to correct *one* little error into which you have fallen with respect to the latter, in attributing to me, the construction of the machine which proved a failure at the Bristol meeting of our Royal Agricultural Society. I was not in any way concerned in the invention or production of that machine, my attention being then engrossed by a different branch of mechanical engineering. I am, sir, your obedient servant. B. SAMUELSON,
Engineer and Iron Founder.
Britannia Iron Works, Banbury, Eng.

[The Scientific American is ubiquitous: a few years ago we published an article on the state of the mechanic arts in the Kingdom of Siam, and in about 18 months after that, we received a communication from a mechanic in that country, as an answer to the article, and which, at the same time, imparted some very useful information. It gives us pleasure to hear how the Scientific American is esteemed in England by the engineers and machinists in that country. They can see that while we have a warm side—which is quite natural in all men—to the inventors and the inventions of our own country, we have no prejudice against those of any other country, and we recognize a universal brotherhood in the inventors of all lands; hence we always speak well of every useful invention, by whomsoever produced. Our field, however, is principally our own country,—the Scientific American from its origin, has been—and it still maintains the same character—"The Repertory of American Inventions," and by thousands of our own countrymen, and many Englishmen, Scotchmen, Frenchmen and Germans, it is very highly esteemed. It shall always be our object to make it more and more deserving of their patronage, respect, and confidence.—[ED.

Faraday on Table Moving.

Prof. Faraday, of London, the celebrated electrician, has been experimenting on table turning, "not, (he says) that it was necessary on my own account, for my conclusions respecting its nature were soon arrived at, and are not changed." He proposes publishing the details at length on his experiments, but in the meantime announces his plan of experimenting, and its results. Assuming that the tables were moved by a *quasi* involuntary muscular action of the operator, Faraday's first point was to prevent the mind having any undue influence over the effects produced in relation to the nature of the substances employed.

A bundle of plates, consisting of sand paper, millboard, glue, glass, and plastic clay, tinfoil, cardboard, gutta percha, vulcanized india rubber, wood and resinous cement, was therefore made up, and tied together, and being placed on a table under the hand of a turner, did not prevent the transmission of the power—the table turned as before. Hence no objection could be taken to the use of these substances in the construction of apparatus. The next point was to determine the place and source of motion, that is to say, whether the table moved the hand, or the hand the table. To ascertain this, indicators were constructed. One of these consisted of a light lever, having its fulcrum on the table, its short arm attached to a pin fixed on a cardboard which could slip on the surface of the table, and its long arm projecting as an index of motion.

It is evident that if the experimenter willed the table to move toward the left, and it did so move before the hands, placed at the time on the cardboard, then the index would move to the left also, the fulcrum going with the table. If the hands involuntarily moved towards the left without the table, the index would go towards the right; and, if neither table nor hands moved, the index itself would remain immovable. The result was, that while the operators saw the index it remained very steady; when it was hidden from them, or they looked away from it, it wavered about, though they believed they always pressed directly downwards; and when the table did not move, there was still, unwittingly, a resultant hand force in the direction it was wanted to make the table move. This resultant of hand force increases as the fingers and hand become stiff, numb, and insensible by continued pressure, till it becomes an amount sufficient to move the table. Mr. Faraday has perfected his testing apparatus, and has placed it on view at the store of Newman, philosophical instrument maker, 122 Regent street, London.

But the most curious effect of this test apparatus is the corrective power it possesses over the mind of the table turner. As soon as the index is placed within view, and the operator perceives that it tells truly whether he is pressing downwards only, or obliquely, then all effects of table turning cease, even though the operator persevered till he becomes weary and worn out. Mr. Faraday adds, in his letter to the "Times," from which the above is extracted, "permit me to say, before concluding, that I have been greatly startled by the revelation which this purely physical subject has made of the public mind. No doubt there are many persons who have formed a right judgment or used a cautious reserve, but their number is almost as nothing to the great body who have believed and borne testimony, as I think, in the cause of error. . . . . I think the system of education that could leave the mental condition of the public body in the state in which this subject found it, must have been greatly deficient in some very important principle."

We believe that education has nothing to do with such a question.

Lord Brougham on Light.

At the Royal Society on June 16th, a paper was read by Lord Brougham, F R S., entitled Experiments and Observations on the properites of Light. The author considers that Newton's experiments to prove that the fringes formed by inflexion, and bordering the shadow of all bodies, are of different breadths, when formed by the homogenous rays of different bands, are the foundations of his theory, and would be perfectly conclusive if the different rays were equally bent out of their course by inflexion, for, in that case, the line joining the centres of the fringes on opposite sides of the shadow being, as he found them, of different lengths, the fringes must be of different breadths. But, if the rays are of different flexibility—if the red, for example, is bent to a greater distance from its course than the violet—the experiment becomes wholly inconclusive, and the line joining the centres may be greater in the red than in the violet, although the breadths of the two fringes are equal, or even though the violet fringe may be broader than the red. A variety of experiments were adduced to show that this property of different flexibility exists, which Sir Isaac Newton had not remarked.

Lord Brougham further states, that this flexibility of light co-exists with the other property, whatever it may be, which disposes the different rays in fringes of different breadths, but he considers that the two properties are wholly independent of each other. He thinks that there is reason to believe that the dark intervals between the fringes made in white light are only the dark tint of the adjoining fringes, of which the red of one runs into the violet of the other. The greatest care in repeating Newton's experiment, with the same distances and sizes both of the body and the beam, leaves little doubt of the fringes running into each other. In homogeneous light it is otherwise; and there appears in that case to be the intervals, as might be expected, from the different flexibility of the different rays. The fringes made in the homogeneous light have a considerable admixture of colors from the scattered rays; so have the small spectra by refraction, made when a second prism is placed behind a small hole in a screen, through which hole the rays of the spectrum made by the first prism, are successively passed. The phenomena of flexion by bodies placed in the portion of the spectrum near the prism, and therefore white, were stated to be not easily accounted for in any received theory. The relations of the doctrine of interference to phenomena are at variance with the doctrine. This is particularly exemplified in the case opposite to each other, but one behind the other. The same phenomena were adduced to disprove Fresnel's hypothesis, that the phenomena of flexion (termed by him "diffraction") depend entirely on the size of the aperture through which the light enters. Three experiments were adduced in disproof of this; the first made on the aperture when the edges are moved to different distances from each other; the second, when the edges are moved to different distances from each other on a line exactly parallel to the rays; the third, when the edges are moved on a line at any inclination to the rays. In both the second and third experiments the vertical distance of the edges being the same, the breadth, as well as the separation of the fringes, is found to vary with the distance of the edges from each other horizontally, or in the direction of the rays.

A Transparent Trap.

A traveller in Western Texas states that the streams of that mountainous region are so clear, that the fish can readily see the tackle that is intended for their destruction, even though the fisherman may manage to keep out of view. Thus I have been tantalized by beholding large fish, in Camanche Creek, especially, and not being able to catch one, though I have persevered for hours, manœuvering in every kind of fashion, and fishing with every kind of bait.

Lieut. Maury will sail for Liverpool on the 22nd inst., to meet at Brussels, in August, a Meteorological Conference of the naval powers of Europe, to fix upon some uniform plan of observations, &c., in connection with Maury's wind and current charts.

NEW INVENTIONS.

Apparatus for Heating Buildings.

An improvement has been made in an apparatus for heating buildings, apartments, and the cabins of vessels by steam, and for which measures have been taken to secure a patent by the inventor, Benj. Irving, of Green Point, near this city. This apparatus differs from all others used for similar purposes; it keeps up a perfect and constant circulation of steam through the radiating pipes, and does not allow of any accumulation of water by condensation in the lower tubes. The return pipe of the heating apparatus is connected with a water coil pipe in the steam boiler, or with some part of the water space which is exposed to the action of the fire, in which a very rapid upward circulation of water is constantly induced by the rapid generation of steam. By this means such an exceedingly rapid circulation is induced from the steam chamber of the boiler, through the feeding, radiating, and return pipes, back into the boiler, that the water which is condensed by surface exposure in the pipes which pass through a room or cabin, is thereby prevented from lodging in the lower radiating pipes, and is returned to the boiler with such constancy and certainty, as to dispense with the feed pump or the complicated arrangement of chambers and self-acting valves, which are sometimes employed to supply boilers with their own returned evaporations, and which are expensive and troublesome.

Improved Rest for Planing Iron.

B. F. Hays of Chicago, Ill., has taken measures to secure a patent for an improvement in the cutter rest for planing iron. It consists, 1st, in employing a double-faced tool-rest, having the faces reversed and planers so arranged that one set will cut the reverse of the other; that is, one set will cut as the reciprocating bed which carries the work to be planed, travels forward, and the other set will cut while the bed is being moved backward. No time is therefore lost in waiting for the return of the bed, as in common iron planers, to take a new cut. Whenever the bed or carriage commences to return, one planer is thrown out of operation, and the reverse planer is thrown into action.

Improvement in Securing Table-Leaves.

T. H. Taylor, of Fayetteville, N. Y., has made an improvement in the manner of securing the leaves of tables in a raised or horizontal position for which he has taken measures to secure a patent. A sector arm is attached by a bridge to the under side of each leaf; the sector arm works through recesses in the rails of the table, and the said arms have also slots cut in their inner ends, in which forked levers play in and out as the table leaves are raised and lowered. The levers retain the sector arms, in a fixed position, so that the leaves cannot fall.

New Gold Machinery.

Jonathan F. Ostrander, of this city, has taken measures to secure a patent for a new crushing and amalgamating machine. The nature of the improvement consists in submitting the gold quartz to the action of a pestle that rolls around and upon the interior surface of a hollow conical basin or mortar, in such a manner as to break and powder the quartz by the continuous rubbing of its surface, rather than a crushing action. This rolling pestle is cylindrical in length, but its bottom forms part of a sphere, and fits into a concave portion of the bottom of the basin. The quartz on being placed inside of the basin, is first reduced to small pieces—coarsely powdered—by the action of the sides of the pestle, and then finely ground by the spherical portion of the pestle, which at the same time works the mercury placed in the basin to amalgamate with and separate the gold from the silicious matters with which it is combined.

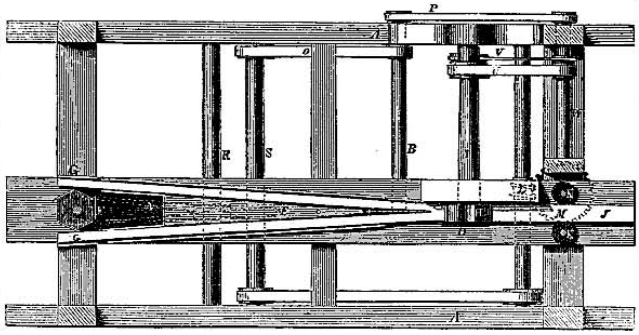
The Grinnell Expedition.

Dr. Kane has arrived in the Advance at St. John's, New Foundland. The people have been very kind to him. The Governor gave him an elegant dinner at his mansion, and they have furnished him with a great many necessary things without fee or reward.

Red Oxyde of Copper.

The Manassas Copper Company of Virginia, of which Mr. Joseph Cowdin, former consul at Glasgow, is now the President, has made a valuable discovery of red oxyde of copper in masses existing in its mines, and which Professor Silliman, Jr., states to be of rare occurrence, and valuable as it is rare. They are found near the surface, over 300 tons ready to be sent forward. Through the vein of this ore, the Manassas Gap Railroad runs, and the products of the mines will add another item to the freighting business of that important road. The mines, it is expected, will be very valuable, and their yield immense.—[Alexandria (Va.) Gazette.

SAWING AND PLANING CLAPBOARDS.---Fig. 1.



The annexed engravings are views of an improvement in machinery for sawing and planing clapboards, invented by Ephraim Parker, of Rock Island, Illinois, who has taken measures to secure a patent.

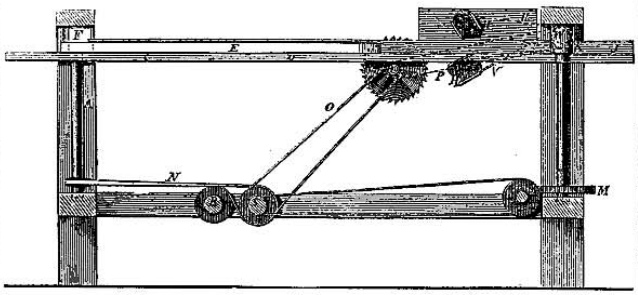
Fig. 1 is a plan or top view of the machine, and fig. 2 is a side elevation of it. The same letters refer to like parts.

The nature of the improvement consists in the employment of a saw, parting-guide, and cutters, arranged and combined in such a manner that clapboards are sawn, planed, and finished in one continuous operation, with great facility and dispatch.

A is a rectangular frame, on the upper part of which is a shaft, B, having a circular saw C, upon one end. D is a longitudinal bed-piece of a suitable width, having a slot, in which the circular saw revolves, the shaft, B, of the same being a short distance below the under surface of the bed, as shown in figure 2. E is a parting guide of triangular or V-shape, the point being towards the saw, as shown in figure 1. This guide is about the height of a board, and is secured to the upper surface of the bed-piece, D. On the outer end of the bed-piece, D, there are rotary cutters, F (any proper form being used), and at the sides of the bed-piece, at its outer end are stationary cutters, G G, one at each side; the stationary cutters are shown in fig. 1, but they are omitted in fig. 2, in order to enable the rotary cutters to be seen. The stationary cutters are placed rather inclined, so as to cut the clapboards bevelling on one side, one edge being thicker than the other, as is usual in clapboards. H H are rotary cutters attached to shafts, I I, one set of cutters being above the board to be sawed and planed, and the other set of cutters below it, as shown in fig. 2. J represents the board; K K are feed rollers between which the board is fed to the saw.

The stuff of which the clapboards are formed is boards previously sawed the required width and thickness, say one inch boards; the board is placed edgewise upon the bed-piece, D, and enters between the feed-rollers, K K. The feed rollers force the board along

Figure 2.



towards the saw, C, which slits the board directly through the centre, and when the slitted portion of the board reaches the point of the parting-guide, E, the point of the guide enters the slit, and the board, as it is forced along, is spread apart by the guide, that is, the same portion of it as shown in figure 1. The rotary cutters, F, being placed at the center of the board, or at equal distances from its sides, are consequently between the two halves or strips of the board; and the cutters, as they rotate, plane the inner sides of the strips, while the stationary cutters, G G, on the outer sides of the strips will shave the strips to the required bevel. The rotary cutters, H H, are for the purpose of planing the upper and bottom edges of the board. Each strip or half of the board, as it comes from the machine, J, forms a clapboard planed and cut to the required thickness—two clapboards cut out of one fed board. The machine is perfectly simple, not liable to get out of repair, and will produce or turn out six thousand clapboards per day, with the attention of but a single hand, the clapboards being perfectly finished and ready for the builder.

Motion may be communicated to the saw, feed rollers, and revolving cutters in any proper manner. In the engravings motion is given the feed rollers by means of a worm wheel, L, and pinion, M, the pinion being attached to the shaft of one of the feed rollers. Motion is given the rotary cutters, F, by means of belts, N O P Q, passing around pulleys on the shafts, R S B, and motion is communicated to the rotary cutters, H H, by means of the belts, U V, passing around the shafts, I I W. Any intelligent mechanic could devise a proper mode to give motion to the working parts.

More information respecting this invention may be obtained by letter addressed to the patentee.

Immense Fraud.

An immense fraud in the coal operations about Pottsville, Pa., has just been exposed. The fraud which was perpetrated in the weighing department has been going on for years. Investigations connected with it have been in progress since 1851, by Mr. Tucker, who finally traced it to the Mine Hill Railroad. Several individuals are said to have made immense fortunes by the operations, while others have been made bankrupts. The fraud was effected by returning false certificates of weight. Investigations are still going on. The Reading Railroad is said to be a loser of from $250,000 to $400,000, and private parties have lost much more.

Broom Corn.

In the Mohawk Valley, N. Y., vast quantities of this crop are annually grown. Pennsylvania, Ohio, and Connecticut are the next largest producers of it. Its origin as a cultivated plant in this country, is attributed to Dr. Franklin. It is a native of India.—Franklin saw an imported whisk of corn in the possession of a lady in Philadelphia, and, while examining it as a curiosity, found a seed, which he planted, and from this small beginning arose this valuable product of industry in the United States. In the same manner England and America are indebted for the weeping willow to the poet Pope, who, finding a green stick in a basket of figs sent to him as a present, from Turkey, stuck it in his garden at Twickenham, and thence propagated this beautiful tree.

Hours of Factory Labor.

A factory difficulty has existed for some time past at Newport, R. I., of which the "Mercury" says:—

"The difficulty between the operatives and employers of our factories has not yet been adjusted, and it is not likely to be settled until after the meeting of all the manufacturers of this State, in Providence, on Monday the 18th inst. It is asserted that the operatives have heretofore worked over thirteen hours a day; a careful investigation shows the time for the whole year to average twelve hours a day."

This may mean that the stated daily hours of labor were more than 13 per day.—By law the hours of factory labor in Rhode Island have been reduced to 10 per day. All the States should adopt the same rule. Massachusetts is much blamed for her long hours of factory labor—a convention of the manufacturers should meet this summer and discuss the question of the "Ten Hour Law."

New Plastic Material.

Five parts of good whiting are mixed with a solution of one part of glue. When the whiting is worked up into a paste with the glue, a proportionate amount of Venetian turpentine is added to it, by which the brittleness of the paste is destroyed. In order to prevent its clinging to the hands whilst the Venetian turpentine is being worked into the paste, a small quantity of linseed oil is added from time to time. The mass may also be colored by kneading in any color that may be desired. It may be pressed into shapes, and used for the production of bas-reliefs and other figures, such as animals, &c. It may also be worked by hand into models, during which operation the hands must be rubbed with linseed oil; the mass must be kept warm during the process. When it cools and dries, which takes place in a few hours, it becomes as hard as stone, and may then be employed for the multiplication of these forms.

Steamboat Building in Pittsburgh.

For the half year ending on the 1st inst., there were twenty-six steamboats built and registered at the port of Pittsburgh, comprising an aggregate tunnage of 5,689 91-95. During the month of January there were entered at the Custom House, two steamers, in February two, in March seven, in April five, in May three, and in June seven. There are now five in the course of completion within the city limits, and fifteen in various yards near the city. Within the same time, ten keels, flats, and barges, have been built and registered.

Bug in the Ohio Forests.

In several of the northern counties of Ohio, the foliage of the trees has been, in certain districts, so generally devoured, that most of the limbs are entirely stripped of their leaves by a brown bug, which flies at dusk and settles upon them. It is about an inch long, and a quarter of an inch in width across its back.

Whatever situation in life you wish or propose for yourself, acquire a clear, lucid idea of the inconveniences attending it, and brace yourself for the work.

Scientific American

NEW-YORK, JULY 23, 1853.

Observation and Invention.

The grand faculty of genius is to revolve a subject over and over in the mind—to view it from many points of observation, and contrast it with other subjects of a like or kindred nature. Inventors are men of observation—thinkers—but this quality of mind requires training in order to produce the most useful results. Thus, for example, a man of an ingenious turn of mind, one who has a strong predilection for mechanics and improvements in machinery, should, to labor economically, first make himself well acquainted with what has been done by others in the different departments of mechanical invention. It would certainly be very foolish for any man possessed of a natural turn for mathematics to be told there was such a book as "Euclid," and yet heeded it not, but plowed right on in the study of this science, to discover that which had been invented by another three thousand year before. It is equally as unwise—as many men have found to their cost—to re-invent machinery which has long been in use. Mechanics and inventors should therefore never miss an opportunity of examining machinery at any exhibition of industry, in order to see what has been accomplished by others. With all the personal examination possible, still there is no man who can possibly be well informed unless he is a reader as well as an observer, thinker, and worker. We have known a great many cases where money, study, and toil were thrown away on inventions which the inventors honestly believed were quite original with them, when in fact they had been illustrated in our columns before they became subscribers. Many cases of this kind are brought to our notice every week, and we are happy to say that we have been the means of saving many men a great waste of time and money by their early communicating with us respecting their projects, and of their receiving from us such information as has led them to labor judiciously and plan to some profit, instead of walking in the footsteps of others.

This one benefit, derivable from a periodical devoted to science, art, and invention, is of no small importance to the world at large, as it tends to the advancement of useful discovery. The reason is plain—ingenious men who would otherwise spend talent, time, and money upon projects which had before been developed and made public, are led to devote their attention to those which are really new, and thus plan and labor to some advantage.

This much we have said in order to direct the attention of ingenious men, who may visit the World's Fair in this city, to the importance of a strict examination into the construction and operation of the machinery on exhibition, especially *new* machines, adapted and applied to do work to which machinery had never been applied before. We are by no means at the end of invention, and new machines generally have many imperfections. At the same time we must caution inquirers against forming opinions too hastily respecting the superlative superiority of all machinery, presented at industrial exhibitions. From our experience we know that there are many machines in operation, which have never been exhibited at any Fair, and will not be exhibited at this one, which are far superior in construction and operation to others of a kindred nature, which have appeared in more than one Industrial Exhibition.

Church Architecture and Decoration.

The gothic style of architecture for churches seems to be all the rage in our city at present. It is no doubt a sublime and commanding style, and when it can be carried out with all its adjuncts in unity, we prefer it to any other. A gothic church "looketh not well" unless it is embowered in trees, or at least separate from contiguous buildings. The heaven pointing spires—a peculiarity of this style—should rise above tall ash trees, the refuge of rooks or robins. It is amusing, however, to notice the incongruities of architecture in some churches, such as a Doric church with a Gothic spire, and sometimes a Grecio-Gothic spire, reminding a person of the portentous head-dresses worn by the ladies in the Middle-Ages, who thereby no doubt thought they were adding charms to their persons by carrying steeples on their crowns. It is just as amusing to behold the base imitation of Middle-Age decoration in all our Gothic churches in respect to decoration. Thus dingy oak and walnut galleries and pews, and dark glass windows, give evidence that because white lead and glass were unknown in the Middle-Ages, they should be rendered null now, and all their beneficial influences held in abeyance to a morbid passion for the grim and gloomy. An abundance of light and a lively chaste style of interior church decoration are not inharmonious, but in harmony with the Gothic style of architecture. It is with church decoration—the interior—that we have the most fault to find with the many modern Gothic churches which have recently been built in and around our city.—A cheerful church leads to a cheerful worship; a gloomy church to fanaticism and bigotry, just like a dog chained in a cellar, which naturally becomes fierce and intractable. In what are termed the best adorned and most expensive Gothic churches which we have seen in our city, there is a violation of true taste in those parts on which most care and attention have been expended; we allude to the gorgeous glass windows. In many of them no taste has been displayed in blending the different colored pieces, the laws of light and shade have been as strictly observed by the designers, as the laws of perspective by the Japanese. It is in the inharmonious blending of colors that the greatest violation of both taste and good sense are shown in most churches. It appears to us that very few of our decorative painters study the blending of colors, their arrangement, depth, contrast, and position so thoroughly as they should do. It is a science as boundless and sweet to the eye as music is to the ear, and it is as difficult to master. The mere skill of hand is not enough; the eye is more fastidious of light and shade than the ear is of sound, but how few decorative painters appreciate this truth. As our city is rapidly increasing in wealth, and as vast sums are now being expended in architecture and decoration, we hope, that what we have said will be the means of directing a more general attention to the "sublime and the beautiful."

Thunder and Lightning.

In the summer of 1851 we had very few thunder storms in this part of our country, and as a consequence quite a number of speculative philosophers rushed into the literary field and gave to the world their reasons for the peculiar absence of heaven's artillery during that season. There was great harmony, we remember, among those sages, all having arrived at about the same conclusions, namely, that the numerous lines of telegraph wires and railroads which had been erected absorbed the atmospheric electricity and prevented its accumulation in a condensed state in the clouds. None of these philosophers have had the candor this year to acknowledge their errors; that would be a too-humiliating act, but at the same time we have not forgotten them.

We do not remember of a season when we were visited with so many and so severe thunder storms; the lightnings have flashed and the thunders have rattled over our heads in sublime and terrific grandeur. Accompanying such visitations we have had many whirlwinds, which, although continuing but for brief periods, have done much damage to life and property in various places.

We have paid much attention to the direction of the lightning, and have come to the conclusion that for one vertical flash that reaches the earth, fifty are horizontal, dissipating in the atmosphere like the fibres of a vine spreading out from the main trunk.—Much injury, however, has been done by the lightning striking various buildings, and which could have been prevented effectually if iron buildings were in common use. An iron building of but very small dimensions could conduct the largest flash to the earth with the utmost certainty of freedom from any danger. If cast-iron cottages and dwellings could be erected at moderate prices, they would surely be preferred to brick or timber. Their style of architecture might be very chaste and ornamental; their assurance of safety during thunder storms would be a great blessing to thousands, especially females of an easily excited temperament. We hope the time is not far distant when iron will be manufactured and sold at one half the present prices, and when neat cast iron cottages and dwellings will be multiplied throughout the length and breadth of our land.

Errors and Falsehoods about Heat and the "Ericsson."

"It is a law of a certain class of minds that some things, which, by every rule of science, ought not to go, *do go*. The steamboat men knew that the "Ericsson" was a sham, and sent one of their number to witness its failure. When he returned, a comrade inquired how it was? 'Why,' said the reporter, 'we all know it is a sham; yet the thing does go, though we know it ought not to.'"

These remarks are from an editorial of the "New York Daily Times" of the 12th inst. There is nothing more beautiful in character, than a strict regard to truth, and nothing so worthy of commendation and praise in an editor than a rigid adherence to it in every case. The first sentiment we have quoted is sheer nonsense; a question of science in relation to the operation of a machine can never be a law of any mind. The assertion about the boiler makers and their agent we pronounce to be a retailed slander, entirely destitute of truth. It slanders our boiler makers as being an ignorant class of men, who did not know that air, when heated, would expand and give motion to machinery. There is not a boiler-maker in our city (we do not mean to be understood as saying that every man who works at boiler making, is a boiler-maker), so destitute of scientific knowledge as not to know this. Every one of them knows, and knew long before the "Ericsson" was floated, that air and any of the gases or expansive fluids, could move machinery by heat being applied to them. Hot air had been employed to move machinery long before the Editor of the Times was born; the question was new to him, but not to engineers. With them it was not even a question of economy, whether it was an agent superior to steam or not; that question, science and experiment had decided long ago, and the utter failure of the "Ericsson," so far, ought to have closed the lips of the Editor of the "Times"—the lecturer on the "Ericsson"—from saying anything on this subject for some time; modesty at least should have dictated this course, as the "Ericsson" is now lying almost, like a sheer hulk, at a Williamsburg dock.

Events of the Week.

The Presidents Tour.—President Pierce on his route to this city, to attend the opening of the Crystal Palace, was received with tokens of great good will by the people of every city through which he passed; Baltimore, Philadelphia, Newark, and New York, delighted to do him honor as the Chief Magistrate of the nation. It is pleasing to witness such demonstrations of respect to the executive power of our country. "Thou shalt not speak evil of the ruler of my people" was the language used by Paul on an important occasion; he rebuked himself for speaking too hastily of the high priest.

Peoples' College.—We have received a copy of the charter of the Peoples' College, of which D. C. McCullum, of Owego, is President. T. R. Morgan, of Binghampton, N. Y., Treasurer, and Harrison Howard, of Lockport, N. Y., Sec'y. The object of this college is to have agriculture with the various branches of manufactures and the mechanic arts taught within the college grounds, manual labor forming a necessary part of the education, like the experiments of chemistry. The designers seek to found an Institution which will enable the sons of farmers, manufacturers, and mechanics to be educated thoroughly, and fitted at once for entering the business of their choice. These objects are good and commendable; it is also contemplated that a department providing for a full scientific and practical course of instruction for females will be organized as soon as a proper and satisfactory plan is perfected. By a resolution of the Trustees, the college is to be located upon a farm of not less than 200 acres. The location we believe has not been selected.

Cheap Newspapers in England.—There is now a prospect of cheap newspapers in England. The tax on advertisements, stamps, and paper has been voted upon in the House of Commons, and abolished. Every advertisement, in England was subjected to a tax of about 30 cents every issue; this kept people from advertising, consequently, except in a very few papers, advertisements of any importance were not found. The men who carried this measure were what are called "the free traders,"—the Manchester school, Cobden, Bright, &c. We have no doubt however, but the "London Times" will still maintain its high character, as its publishers have great wealth, enterprize, and experience to guide them.

The Ericsson.—A correspondent of the "Franklin Journal," states that the Ericsson ship is to have new engines of an entirely different construction and nature from those which have been taken out. He states that the new hot air cylinders are to be only 6 feet in diameter, and the supply pumps only 3½ feet. The same air is to be used over and over again, only it is to be cooled—condensed—with water after it leaves the cylinders.—This, if true, is throwing away the regenerators, which Capt. Ericsson called his "source of power." We presume, however, that the said correspondent is misinformed; at the same time, let us say, that there is altogether too much mystery about the repairs of this vessel,—the rumors respecting its destiny are quite contradictory.

Hoe's Lightning Presses.—We learn by the "Philadelphia Ledger," that the publishers have recently had two of Hoe's eight cylinder lightning presses put in operation to meet the demands of the "Ledger's" great circulation. This is certainly an evidence of its prosperity, and no less an evidence of the superiority of the Hoe press; no other that we have seen, has yet been able to "hoe it out," but it "has hoed all others out" in fast printing.

Increase of Light—Prof. James Swaim, of Philadelphia has informed us that if the flame of an oil lamp with a flat wick is brought nearly into contact with a bat's-wing gas burner, the intensity of the light will be increased in a double proportion (a quadruple of one), to that which is due to both lights when separate. We have not had an opportunity of trying the experiment yet, and some of our readers may be able to do so before we can; the information is therefore thrown out for that purpose. It is not known whether or not there is an increased consumption of oil with the increase of luminosity.

Faraday.—In the remarks of the celebrated Faraday in another column, on table moving, nothing is said about the tables moving without any person touching them. We have heard of such doings in our country, but have never seen either the one or the other.

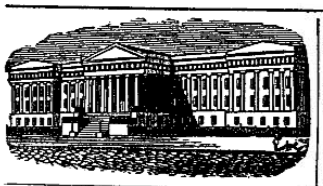
A Scientific Expedition.

In a letter to the "London Times," Col. E. Elers Napier, proposes that government should fit out a scientific expedition to Quilca Mombes, or some other point of Zanzibar, and thence penetrating westward beyond the snowy mountains recently discovered about two hundred miles inland, ascertain if the inland sea, reported to be there, is a part of Maravi, which sea probably debouches into the channel of the White Nile.

Sub-Marine Blasting.

Mons. Maillefert is now engaged under the authority of the General Government, in removing "Middle Rock" from the entrance of New Haven harbor. On Monday, twelve charges of powder, each of 125 pounds, were fired in rapid succession, reducing the height of the rock about one foot.

The marble quarries of Vermont are gaining a reputation abroad as well as at home. Two blocks of Vermont marble, weighing one ton each, have been ordered from Rome, for the purpose of making a bust. This order is from an Italian artist, who prefers the West Rutland marble to that of his own country.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 12, 1853.

PRESSURE GAUGES—By E. H. Ashcroft, of Boston Mass.: I claim the method of rendering the indications of bent tube pressure gauges permanent and reliable, by constructing said tubes of precious metal, as set forth.

SHOT CHARGERS—By C. W. Camp, of Hartford, Conn.: I claim the method of making and the application of the revolving cut-off and spring to shot chargers, as described.

BUTTER WORKERS—By E J. Dickey, of Hopewell Cottonworks, Pa: I claim the adjustable knives arranged within the box of said machine, and operating in conjunction with the reciprocating pressure, substantially in the manner set forth.

I also claim the recess or depression in the bottom of the box for the purpose of preventing the butter adhering to the presser, and being drawn back during its receding motion, as described.

APPARATUS FOR ILLUSTRATING THE MOTION OF A PENDULUM UPON THE EARTH'S SURFACE—By G. M. Dimmock, of Springfield, Mass: I claim the application to an artificial globe of one or more pendulums the rods of which are formed of delicate springs, so as to vibrate evenly to all points of the dial, the plane of which is at right angles to the pendulum when at rest

I also claim the bending or springing the pendulum rods, to counteract the gravity of the earth, so when at rest they will be straight and on the line from the point of suspension, and the centre of the globe; furthermore, I claim anything substantially the same.

TANNING—By J. J. Fulton, of Alleghany City, Pa.: I claim the use of muriate of ammonia, in combination with nitre, for the purpose of suspending putrefaction, adding strength to the animal tissues, and for usual purposes in the manufacture of leather, as set forth.

HOSE COUPLING—By Smith Groom, of Troy, N Y. I claim the spring conduit and the appendages by which it is moved longitudinally, and is held firmly against the packing and the pads or rim in which the packing rests, to prevent the joint from leaking in combination with the arrangement of spring bolts and their appendages, as shown, with the circular groove, as set forth.

SHEET METAL BEAMS—By Richard Montgomery (assignor to Elizabeth Montgomery), of New York City. Patented in England Oct. 13 1852: I claim a beam formed of sheet metal bent into a series of longitudinal folds, the sides of which are flat and parallel, and the tops and bottoms uninverted and inverted arches respectively

I also claim the combination with such a beam of a pair of saddles to support its ends, as set forth.

METALLIC PENS—By Myer Phineas, of New York City: I claim constructing the back of the pen with a series of transverse ribs and slots, and leaving two flat springs beneath, nearly parallel to the back and free to bend between the ribs; the effect of this construction being to give to the pen combined stiffness and flexibility within certain limits, re-embling that produced by a series of vertebral articulations, and which is found to render the working of the pen more easy and pleasant than any form of metallic pens heretofore essayed.

COIN SAFE AND DETECTOR—By H. G. Robinson, of Schuylkill Haven, Pa.: I claim the peculiar construction of the implement and the manner in which the several parts are arranged, by which construction and arrangement I combine a portable receptacle for both coin and bank notes, convenient for the pocket, and a counterfeit coin detector. The implement being formed of a cylindrical case, having a gauge box or receptacle at one end, and the remaining portion of the case enclosing the clamps, for the purpose shown, and otherwise constructed as set forth.

[See engraving of this invention on page 116, this volume of the Sci. Am]

BORING MACHINES—By S. T Sanford, of Fall River Mass: I claim fitting the auger stock by a ball and socket, or other universal joint to an arm, which is connected with a fixed base or standard, so as to be capable of moving in arcs, at any angle to each other, and giving rotary motion to the auger so arranged, by means of a pulley attached to the auger, and a band receiving motion from a pulley on a shaft, at the butt end of the pole or arm, as described.

[See notice of this invention on page 196, this volume, Sci. Am.]

ADJUSTING DISHING SAWS—By E. B. Wells, of Uniontown, Pa.: I claim the adjustable rings in combination with the concave and convex washers, as described, for the purpose of holding and regulating the saw to any required curvature.

STRAW CUTTERS—By I P Smith, of Rochester, N. Y., and O. W. Seely (assignor to O W Seely), of Albany, N Y.: We claim the arrangement of the metallic guide in combination with the knife frame, and the knife formed as specified, and with the frame against whose front edge the knife is intended to play; the last-mentioned frame to be adjusted to its place by springs and screws, contained in hollow boxes or cars, and by trunnions and shoulders, as set forth

FORMING TEETH ON MILL SAWS—By N. T. Coffin, of Knightstown, Ind: I claim the dies and gauge constructed as described, by means of which uniform caisal points are given to saw teeth by swedging, as specified

Also the combination of the two files, the block, turned surface, and regulating screw, forming together the file gauge, by means of which, when used in combination with the bevelled file, the chisel pointed saw teeth described, are dressed, jointed and have their edges rendered uniform, as specified.

ADJUSTABLE SCREW PROPELLERS—By Chas. F. Brown, of Warren, R. I: I claim, first, arranging the pivots of the adjustable blades, out of the centre of the hub or at a distance from the axis and carrying them right through the hub, as described, whereby they obtain a greater depth of bearing without placing one blade behind the other and thereby rendering it necessary to cut away and weaken the after part of the vessel unnecessarily; this I claim without reference to precise means by which I turn the said pivots to adjust the blades

Second, the employment of one of the adjustable blades of the screw propeller or a rudder, in case of need, when the said blade is operated for this purpose by mechanism, such as described, which also serves to adjust the blades as a propeller.

[See engraving of this invention on page 273, Vol. 7, Sci. Am]

LOCKS FOR BANKS—By Linus Yale, Jr., of Newport, N Y.: I claim impressing the form of the key upon inert tumblers or their equivalents, which shall retain said impression, which, being separated from the key and beyond reach or influence through the key hole before they can touch the fence, as described

I also claim, in combination with the inert tumblers, the cross bolt which takes the strain of end pressure on the main bolt, and acting as a tumbler carriage to convey the tumblers beyond reach or influence through the key-hole when it moves them to the fence out of its locked position with the main bolt.

RAILROAD CAR SEATS—By C. P. Bailey, of Muskingum, Ohio (assignor to "Union Patent Sofa and Railroad Car Seat Manufacturing Company," of New York City): I claim so hanging a reversible car-seat, whose seat when reversed forms a portion of the back, and vice versa, as that it shall occupy the same space after it is reversed that it did before, or hang between or nearly so, the same parallel lines that it did before reversing, and so that also the seat and back may have an adjustment together or independent of each other, as described, and this I claim, whether the seat is divided into two or more parts, or used without division, as set forth.

DESIGN.

COOK STOVE—By Samuel Pierce & J. J Dudley, of Troy, N. Y. (assignor to Johnson, Cox & Fuller.)

American Clocks for China.

We hope the following interesting article from Chamber's Journal will arrest the attention of our American clock makers:—

"With all their ingenuity and industry, the Chinese appear to employ themselves but little in the art of clock-making; and it may be safely declared that Geneva turns out more time-keepers in a year than are produced in the whole of the Celestial Empire. In the large city of Nankin there are not more than forty clock makers: Su-chew has thirty, and Ning-po not more than seven; while, until recently, the value of the clocks and watches imported into China from Europe, amounted to about half a million dollars yearly. It is said that the number of clocks really manufactured in the country in a twelve month does not exceed 1,500—a fact the more remarkable when contrasted with the state of the case in other countries. The watch and clock-makers in London, including those who manufacture portions of the mechanism only, amount to more than 1,000; and, as is well known, the enterprising horologists of New England make and export clocks every year by tens of thousands. These latter, with that keen spirit of trade which characterizes them, have lately been turning their attention to China as a profitable market for their handicraft; and a request was dispatched some time since from the United States Patent Office, to such American citizens as were resident in the flowery land, for any information that might promise to benefit the branch of industry in question.

From one of the replies which this "request" elicited, we gather that the Chinese have always been too deficient in their acquaintance with astronomy and mathematics to construct proper sun-dials; and that their knowledge of these instruments was obtained from Europeans, while hour-glasses are known only as a contrivance 'employed in western countries to measure time.' Many Celestial gentlemen make it a *sine qua non* to carry two watches; among these, specimens of very ancient workmanship are sometimes met with as rotund as 'Nuremberg eggs;' and the wearers are too often anxious to make the pair go well together. The trouble they gave in consequence, in former days, to some of the Jesuit Fathers who were skilled in clock-making will be found mentioned in the 'Lettres Edifiantes et Curieuses.'

A Chinese day comprises twelve periods, each equivalent to two hours, and they are represented by twelve characters on the clock-face, being those used also to designate the months. 'The first in the list (meaning Son) is employed at the commencement of every cycle, and to the first of every period of twelve years, and also to the commencement of the civil day—at 11 P. M.—comprehending the period between this and 1 A. M. The month which is signified by this term is not the first of the Chinese year, but, singularly enough coincides with January. Each of the twelve hours is divided into eight "kih," corresponding to quarter-hours. The diurnal division of time does not appear to have been in use in the time of Confucius, as mention is made in the spring and autumn annals of the ten hours of the day.'

The writer whose remarks we quote, recommends his countrymen, in manufacturing clocks for the Chinese, to adopt the clock-face commonly used in China, with some improvements, one of which would be to surround the twelve 'hoary characters' with a ring of numerals from one to twenty-four, every alternate one of which would be opposite the half-hour mark of the inner circle, corresponding with a whole hour of our time, and to continue the use of the four signs which now stand near the centre of the face to indicate midnight, dawn, noon, and evening. The pendulum is to vibrate seconds; the minute-hand to make half a revolution at every sixty seconds; and the hour-hand is to go but once round the face in the whole diurnal period. As the result of this arrangement—"At one o'clock P. M., our reckoning, the hour hand will be half-way between the large character at the top, and the next one to the right; and the minute-hand, having made half a revolution, will point perpendicularly downward, and the clock strike one. At the expiration of another of our hours, a whole Chinese hour will have expired, when the former hand will have reached the first large character to the right, and the latter will be directed to the zenith—the clock striking two.' The minute hand is therefore to make twelve revolutions in the twenty-four hours.

The clocks are to be constructed with lines and weights as those with springs are not liked in China; and as a Celestial always likes to see what he is buying, it is suggested that the works be made as visible as possible, and of good quality, to avoid the loss that would be sure to follow attempts to palm off clocks made to sell merely. To gratify the Chinese wish for utility, the lower part of the door is to contain a looking-glass, or if not this, something very ornamental; and inside, instructions in the native character for fixing, winding, regulating, &c. Such clocks as are here described can be manufactured in Connecticut for $2 50 each; and as they can be sold in China at from $5 to $6 each, we may shortly expect to see a great and profitable trade in American time-keepers between the two countries."

Recent Foreign Inventions.

ARTIFICIAL LIGHT.—E. H. Jackson, of Soho patentee.—This is for an improvement in the electric light. There is a self-acting regulator for the electrodes of the lamp and a governor for controlling the action of the galvanic current to be used therewith. The electrode regulator is composed of two insulated metal tubes connected together by a spiral spring, and capable of sliding one within the other. They are placed in connection with the wires of the battery, and when the current is on, they are drawn together, compressing the spring, by the expansion of which they are gradually forced apart, as the *carbon points*, (like wicks of candles) are consumed; one of the tubes, is by its motion kept in its proper relative position with respect to the other electrode. The current governor consists of a glass globe containing a saline solution mixed with sulphuric acid through which the current has to pass. An indicator is attached to the apparatus to show the power of the battery current. This is simply an improvement on old electric light apparatus; its success depends on its economy in comparison with gas light.

IRON FOR SHIPBUILDING.—Robert McGavin, of Glasgow patentee.—The object of this invention is the preparation of iron plates for shipbuilding purposes to prevent the adherence of barnacles to them. This is accomplished by mixing with the iron during the process of manufacturing it, as in large a proportion of it as it will take up without deterioration to its strength and tenacity. The proportion of arsenic given is from 2 to 5 per cent. according the quality of iron used. The arsenic is introduced in the puddling process, but it may also be applied by introducing it between the surfaces of the blocks of iron previous to the rolling operation; a further quantity of arsenic is sprinkled on the surface of the heated plates towards the completion of the process. When rolled, the plates are scoured with acid, rubbed smooth with holystone, and then immersed in a bath of melted spelter, lead, tin, or zinc mixed with arsenic.

PURIFYING SEA AND OTHER WATER.—Louis Pocock, of London, patentee.—Chemical and mechanical agency are employed in the operations. The apparatus employed consists of an evaporator, which communicates through an intermediate vessel, with a worm condenser or refrigerator; the connection of the three is effected by suitable pipes. Sea water is pumped into the refrigerator until it is nearly filled, and in order to effect the precipitation of the lime, magnesia, &c., contained in the water, in an insoluble state, hydrate of soda or potash is added, in the proportion of 2 ozs. to every 22 gallons of water. After standing about 25 minutes to allow precipitation to take place, the water is pumped into the evaporator, and a small portion into the intermediate vessel. The fire is then lighted in the evaporator and distillation commences. The vapor passes into the intermediate vessel, where it parts with any impurities carried over with it, and from thence it is carried through the worm in the refrigerator, where it is condensed. This distilled water possesses the common vapid taste of water produced by distillation, but has no empyreumatic flavor owing to the complete precipitation of the matters which it contained before distillation. To render it palatable, chlorine water, derived from the hydrochlorate of lime is added in the proportions of from 4 to 20 grains to every 22 gallons. It is then agitated and exposed to the air after which it is filtered through charcoal and thus brought to a condition fit for domestic and other purposes.

SUGAR REFINING.—Robert Galloway, of Cartmel, Eng., patentee.—This invention consists in employing lime combined with lead, or saccharate of lead, or other combination of lead capable of acting in a similar manner to the plumbite of lime in defecating saccharine solutions. Also in using the saccharate of lead when acetate of lead is employed combined with the use of lime or magnesia previous to, or after the acetate of lead in refining saccharine solutions. Also in employing acetate of lead twice, some other process being adopted intermediately, and in using bicarbonate of lime or magnesia for neutralizing the acetate of lead.

Selected and condensed from "London Mechanics' Magazine," and "Newton's Repertory of Inventions."

Operation of the New Steamboat Law.

The "Cincinnati Commercial" publishes the report of the local inspectors of steamboats at the ports of Pittsburg, Wheeling, and Cincinnati, made in accordance with the new steamboat law, passed by the last session of Congress. The reports set forth that much good has attended the enforcement of this law thus far, and that by its strict observance in future there will be an immense saving of life and property from the rashness and recklessness of many of those who are in command of steamboats in the western waters. Great good has resulted from the system of licensing engineers and pilots, particularly in reforming their habits and restraining them from the evils of intemperance. Very many who were strongly addicted to a dissipated life have, been wholly reclaimed, while others have been warned and benefited.

Smoking in Railway Cars.

It is stated that an important railway question was recently decided in England. The Edinburgh and Glasgow Company were sued by a passenger, who had a yearly ticket, for damages sustained by him from danger of fire and the injury to his feelings, in consequence of the non-enforcement of the rule against smoking. The decision was, that the company are liable, in every case of smoking, to the infliction of a penalty of 40 shillings, and they were fined accordingly.

Cotton Falsely Packed.

The "Memphis Enquirer" says, that a great deal of cotton, falsely packed, was shipped from that port the past season, one bale of which was returned to the commission merchant a few days since at Memphis, who suffers a loss of $48 on the bale, unless he should be able to recover from the planter.

TO CORRESPONDENTS.

W F F., of N. Y—Letters addressed to "J Faber" belong to you. It will not make any difference when the patent is issued your name will then be published correct in the list.

P H H, of N. Y.—You are right respecting the ligneous marble; it is a cement made by the artist who put it on in the "North Star;" it cannot be purchased; the artist keeps its preparation a secret. You can make a good cement for your purpose by mixing putty, some plaster of Paris, a little white lead, and dissolved glue together.

G W. P, of N. H.—Yours is what is termed the "duck's foot propeller," it is illustrated in Macfarlane's "History of Propellers;" it was invented by the Earl of Stanhope.

J. C. S, of N. Y.—We are not aware of the guides ever having been applied to Whitelaw & Stirratt's wheel. No 28, this Vol Sci. Am, contains the illustrated article to which you have referred.

R. G G, of N. Y—We do not remember to have seen a railroad truck like yours; you had better send a model of it for further examination: at present we have very little faith in the plan.

R, of Nova Scotia—We cannot give the information you desire, but we think you can obtain it by addressing G. & J A Cormack, 76 West 41st street, this city; they are large manufacturers of oakum, and must have every facility necessary in the business

L G, of N. Y—There is nothing new or patentable in a double flanged car wheel; if there is any advantage to be gained from guides, it is not apparent to us.

J P. N., of N. Y—You wish to know what we think of your railroad brake. Well, we think it just like a great many diagrams of the same plan which has been submitted to us before. The plan is not feasible for several reasons.

D D, of Ebery's Mills—If you will send us the date of the patent as near as you can get it, it will save us much trouble in finding what you want; al so send us your post office address.

J O, of Ind—We have only two subscribers at your place besides yourself.

A number of our correspondents will receive more attention next week.

A G, of Ill.—Yours has been received and will meet with attention.

J M, of N. Y—Your model has come to hand; you will soon receive an answer.

R. J., of Wis—You are correct respecting heat; it is just like what we call force, and in no manner is it different in action from that which is applied physically by any power—gravity, wind, electricity or nervous

J. G. L., of Pa—Old Pennsylvania is a great State, rich in natural resources, and should be the greatest manufactruing State, twice, told in the Union. If you use the chlorids of soda you will find it excellent for washing along with soap and removing all stains and effluvia from cotton clothes.

Money received on account of Patent Office business for the week ending Saturday, July 16:—

G H D., of Pa., $55; G & B., of N Y, $30; H D M., of Wis, $55; C C, of Ind, $30; J. P., of Ky., $25; J. N., of Ohio, $55; A. P. C., of Pa, $10

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday July 16:—

J. S., of Va; A C C, of Ky.; C. C, of Ind.; A.A., of N. Y.; A. W S R, of S. C.

A Chapter of Suggestions, &c.

Patentees—Remember we are always willing to execute and publish engravings of your inventions, provided they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

Give Intelligible Directions—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

Back Numbers and Volumes—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement —Of Volumes I, 2 3 and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1?5. Of Volume 6, all; price in sheets, $2; bound, $2.75. Of Vol. 7 all; price in sheets, $2; bound, $2,75. Of Vol. 8, all the back numbers subsequent to No. 27, but none previous.

Patent Claims—Persons desiring the claims of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office—stating the name of the patentee, and enclosing one dollar as fee for copying.

Patent Laws, and Guide to Inventors.—We publish, and have for sale, the Patent Laws of the United States. The pamphlet contains not only the laws but all information touching the rules and regulation of the Patent Office. Price 12 1-2 cts. per copy.

ADVERTISEMENTS.

Foreign and American Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office, 128 Fulton street, New York.

FOR SALE—The lease and fixtures of a machine Shop, situated in one of the best business locations in the city, and connected with a Foundry, Steam Engine, Lathes, &c., nearly new and in operation at the present time Apply at 86 Chamber st, New York. 1*

COTTON MACHINERY—For sale, very low, viz 1 30 inch batt card, 1 warper, 2 dresser fans, and 1 iron boiler. Apply to E. WHITNEY, New Haven, Ct. 45 6

LAWRENCE SCIENTIFIC SCHOOL, Harvard University, Cambridge, Mass. The next term of this institution will open on the first day of Sept., 1853, and continue 20 weeks. Instruction by recitations, lectures and practical exercises, according to the nature of the study, will be given in Astronomy, by Messrs Bond; Botany, by Prof Gray; Chemistry, Analytical and Practical, by Prof. Horsford; Comparative Anatomy and Physiology, by Prof Wyman, Engineering, by Prof. Eustis; Mathematics, by Prof Pierce; Mineralogy, by Prof. Cooke; Physics, by Prof. Lovering; Zoology and Geology, by Prof. Agassiz For further information concerning he School. application may be made to Prof. E. N Horsford, Dean of the Faculty.

Cambridge, Mass, July 15, 1853. 44 8*

SIXTH ANNUAL EXHIBITION OF THE MARYLAND INSTITUTE, will open at the unrivalled Hall of the Institute, in the city of Baltimore, on Monday the 3rd day of October, 1853, where articles for competition and premium will be received from Monday, 26th, to Thursday 29th of September, inclusive; after which deposits will be entered for exhibition only. To this Exhibition the artists, inventors, manufacturers, &c., of the entire union, are cordially invited to contribute. The central location of Baltimore, and the high reputation of the Maryland Institute Fairs, will afford them very great advantages in introducing their articles to the public, as there will congregate a great number of persons from every part of the Union. Circulars and any information required will be promptly furnished by application, post paid, to John S Selby, Actuary. THOS. TREMBLE, Chairman of Exhibition Com. 40 6

A GOOD CHANCE FOR MANUFACTURING —A Water Privilege of ten feet fall, on a never-failing stream, with four acres of choice land, in the town of Cornwall, Orange Co., N. Y., 5 miles from the North River, and three miles from the railroad depot, and on the line of survey of the Albany and Hoboken RR. For particulars inquire of John J Vanduzer, 184 Canal st, N. Y., or John Orr, on the premises. 40 13*

McALLISTER & BROTHER—Opticians and dealers in mathematical instruments, 48 Chesnut st. Philadelphia Pa. Mathematical instruments separate and in cases, Protractors, Spacing Dividers, Drawing Pens, Ivory Scales. Tape Measures, Salometers, Bourdon Steam Gauge, Spy Glasses, Microscopes, Hydrometers, &c., &c. An illustrated and priced catalogue will be sent by mail free of charge. 39 6m*

IMPROVED CHUCK.—We, the undersigned, being engaged in the manufacture of an Improved Universal Screw Chuck, so arranged as to work the jaws together or separately with other conveniences, are now prepared to attend to orders at short notice The securing of a patent is anticipated. E. B. WHITE & CO. 43 6*

EXCELSIOR SAND PAPER, GLUE—Premium "Excelsior" Sand and Emery Papers; these papers practical mechanics have decided to be the best the market affords; also "Abbott's" Manilla Sand, and Match Papers, Emery Cloth, Emery of the "Prospect Mills" brand, Corundrum, Pumice Stone ground and in lump. of very superior quality; also Glue of Upton's, Cooper's, and all other brands, in quantities to suit, at the manufacturers' lowest prices, for sale by WILLIAM B. PARSONS, 290 Pearl street, (corner Beekman) N. Y. 40 8*

IRON FOUNDERS' FACING MATERIALS—Viz, Pulverized Black Lead, Soapstone, Hardwood Charcoal, Anthracite, and Sea Coal, of approved quality, for sale by G. O. ROBERTSON, office 135 Water st, corner of Pine, New York. 38 8*

FIRE BRICKS—Fire Clay, Fire Sand, and Moulding Sand, for Iron and Brass Founders, for sale by G. O. ROBERTSON, 135 Water st, corner of Pine, New York. 38 8*

JAMES D. JOHNSON, Bridgeport, Ct., Proprietor of Wood's Patent Shingle Machine. Persons wishing to purchase rights or machines, can address as above. This is unquestionably the best machine in use for cutting shingles. 33tf

CIRCULAR SAW MILLS—The undersigned are manufacturing, and keep constantly on hand, "Child's Premium Double and Single Circular Sawing Machines" The best machines in use for sawing lumber from logs of all sizes, and warranted capable of cutting more lumber in a given time than any other mill. Shafting, gearing, and all other mill work made to order, with dispatch and in a workmanlike manner. H. WELLS & Co.

Florence, Hampshire Co., Mass. 44 6*

E. A. BOURRY & H. E. ROEDER—Consulting and Mechanical Engineers; Office No. 333 Broadway, New York City. 43 9*

NOTICE TO IRON MASTERS —We hereby caution iron masters against purchasing the right to use any furnace for the manufacture of malleable iron directly from the ore, having a "down blast" therein, and we believe those are the only kind now in successful operation, as any use of said down blast will be an infringement upon the patent granted to G A Whipple, 10th May, 1853. The proprietors of said patent will sell the right to use said invention in furnace or territorial rights, by which iron can be made from $8 to $12 per ton cheaper than in any other way. They will also guarantee the free use of all necessary apparatus for manufacturing malleable iron directly from the ore without infringing on any other patent right. Application for further information can be made to J. J GREENOUGH, Attorney for the Proprietors, No. 6 Wall street, New York. 45 3

NORRIS WORKS, Norristown, Pa The subscribers build and send to any part of the United States, Pumping, Hoisting, Stamping and Portable Engines, and Mining Machinery of every description THOMAS, CORSON & WEST. 40 1y.

AMERICAN PIG IRON—Of the brands Wm. Penn, Swede, Anemia, Durham, Allentown, Scrittg, Crane, and Mount Hope—also Scotch Pig Iron of favorite brand, constantly on hand and for sale by G. O. ROBERTSON, 135 Water street, cor. of Pine. 43 8*

NORCROSS ROTARY PLANING MACHINE, —Decided by the Circuit Court not to infringe the Woodworth Machine—I now offer my Planing Machines at a low price; they are not surpassed by any machines as to amount or quality of work. Tongueing and grooving machines also for sale, doing one or both edges as desired; 80 machines now in operation. Address me at Lowell, Mass.,

39 20* N. G. NORCROSS.

ANDREWS & JESSUP—No. 70 Pine street New York, Commission Merchants for the sale of all kinds of Cotton and Woolen Machinery, Machinists' Tools, Belting, &c. Importers and dealers in every variety of manufacturers' articles. 43tf

GARDINER'S PATENT MAGNETIC GOLD Washer. Amalgamator and Separator.—This is the most perfect machine for Gold Mining that has been invented; it performs the operation of washing the earth or pulverized quartz rock, amalgamating and magnetic separation or black sand or oxyde of iron, all at one movement, saving every particle of gold dust, however minute. With this machine two men can perform as much work per day as ten by any other process, and save all the gold A full explanation of its operation will be given by the manufacturer. The public are invited to examine Price $250. Iron Retorts at wholesale and retail.

NORTON & GARDINER,

40tf 47 Dey street, N. Y.

ENGINEERING—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers, and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing. Faber's Water Gauge. Sewall's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc etc.

CHARLES W COPELAND,

29 26* Consulting Engineer, 64 Broadway.

LATHES FOR BROOM HANDLES, &c.—We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch and work as smoothly as on a straight line—and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post.paid) MUNN & CO.

At this Office.

PATENT LAWS OF THE UNITED STATES, and information to inventors and patentees; for sale at the Scientific American office. Price 12 1-2 cents.

WHEELER, WILSON, & Co.—Watertown, Ct., proprietors and manufacturers of Allen B Wilson's Patent Stitching Machine. Patented June 15, 1852, it can be seen at the Company's Office 265 Broadway, New York. 39 20*

ATMOSPHERIC TELEGRAPH—The English patent (just issued) is now offered for sale at the Company's office, 24 Merchant's Exchange Boston, Mass. I. S. RICHARDSON,

35tf Agent A. T Company.

KRUPP'S (London Council Medal 1851) CELEBRATED CAST STEEL—Of any dimensions, warranted superior to any other for Platers and other Rollers requiring hardening; also for hydraulic and other pistons, railway axles, and shafts for steam engines, &c &c. This cast steel admits of welding without borax with the same facility as iron. THOS. PROSSER & SON, 28 Platt street, New York. 39tf

NEW WORKS ON CIVIL ENGINEERING—The Field Practice of Laying out Circular Curves for Railroads: by John C. Trautwine, C E; second edition, in pocket book form. A New and Rapid Method of Calculating the Cubic Contents of Excavations and embankments, by the aid of Diagrams: by John C Trautwine, C. E., with 10 copper-plates Price $1 each; postage on the Curves, 5 cents, and on the 8 Excavations and Embankments, 8 cents. The postage may be remitted or not, as the Post Office does not require pre-payment. For sale by Wm. HAMILTON, Hall of the Franklin Institute, Phila 35 3m

PROSPECT MILLS EMERY—This article has been thoroughly tested by many of our practical machinists, and proved equal to the best "London Extra" Emery; for sale in lots to suit by WM. B. PARSONS, 290 Pearl st, N. Y. 40 8*

STEAM ENGINE FOR SALE—7 horse-power, new, and in good order: also a cylinder boiler for the engine; it has been used but is in good condition; price $500; the Engine is worth the money. Address MUNN & CO. Scientific American Office

UPTON'S GLUE—This celebrated brand is noted for its great strength and durability, having been proved by Chickering and Gilbert, the great piano makers of Boston, to be the only glue that will tand in all climates. For sale in barrels and cases by WM B. PARSONS, Sole Agent, 290 Pearl st, cor. Beekman, N. Y. 40 8*

NEW METHOD FOR MAKING WROUGHT-Iron direct from the Ore—The proprietors of James Henlon's Patent, who have purchased Alex. Dickerson's patent for the above purpose, are desirous of introducing the invention into general use, and invite parties who may wish to negotiate for rights for States and counties, or for furnaces, to make immediate application, and to examine the furnace which is in successful operation at the American Iron Company's Works, Newark, N. J. The invention is exciting considerable interest; gentlemen from all parts of the country, who are engaged in the manufacture of iron, have examined the furnace in its workings, and give it their decided commendation. A circular, giving more minute information, will be sent to those desiring it. The rights for several States and counties have already been disposed of. Applications for rights in the State of New Jersey may address the Hon. J. M. Quinby, President of the American Iron Company. Inquiries or applications for other States may be made to A H. BROWN, Newark, N. J, Office 107 Market st. 34tf

BEARDSLEE'S PATENT PLANING Tongue ing and Grooving Machines—These celebrated machines have now been generally introduced in various portions of the United States. More than thirty are now in successful practical operation in the State of New York alone. As an illustration of the extent of work which they are capable of performing, with unrivalled perfection, it is sufficient to state that, within the last six months and a half, over five millions of feet of spruce flooring have been planed, tongued and grooved by one of these machines at Plattsburgh, N. Y.. never running to exceed ten hours a day. The claim that the Beardslee machine was an infringement upon the Woodworth patent, has been finally abandoned; and after the proofs had been taken, the suit instituted by the owners of that patent was discontinued, and the whole controversy terminated on the first of November last. Applications for machines or rights may be made to the subscriber, GEO. W. BEARDSLEE, 57 State street, or No. 764 Broadway, Albany.

15tf

THE NEW HAVEN MANUFACTURING Company, New Haven, Conn., having purchased the entire right of E. Harrison's Flour and Grain Mill, for the United States and Territories, for the term of five years, are now prepared to furnish saw mills at short notice. These mills are unequalled by any other mill in use, and will grind from 20 to 30 bushels per hour of fine meal, and will run 24 hours per day, without heating, as the mills are self-cooling. They weigh from 1400 to 1500 lbs., of the best French burr stone, 30 inches in diameter: snugly packed in a cast-iron frame, price of mill $200, packing $5. Terms cash Further particulars can be had by addressing as above, post-paid, or to S C Hills agent N. H. M. Co., 12 Platt st, N. Y. 28tf

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears, Morticing and Tennoning machines; Belting; machinery oil, Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 40tf

A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American. 16tf

LEONARD'S MACHINERY DEPOT, 109 Pearl-st. and 60 Beaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinists's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting.

40tf P. A. LEONARD.

PAINTS, &c. &c.—American Atomic Drier Graining Colors, Anti-friction Paste, Gold Size, Zinc Driers, and Stove Polish.

27tf QUARTERMAN & SON, 114 John st., Painters and Chemists.

LOGAN VAIL & CO., No. 9 Gold st, New York Agency for Geo Vail & Co, Speedwell Iron Works, Norristown, N. J, furnish and keep on hand Portable Steam Engines of various sizes, Saw and Grist Mill Irons, Hotchkiss's Water Wheels, Iron Water Wheels of any size, Portable Saw Mills, complete; Bogardus's celebrated Planetary Horse Powers; heaving forgings and castings for steamboats and rolling mills, Ratchet Drills of superior quality for machinists, Saw Gummers, Hand drills, Tyre Benders, and shafting and machinery generally.

38 1y

GERMAN BLACK LEAD—The best kind for polishing stoves, for sale in bulk by G O ROBERTSON, 135 Water st, corner of Pine, N. Y. 38 8*

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines, the best in use, and applicable alike to thick or thin staves; also his Head Cutting and Turning, and Stave Jointing Machines.

For machines or territorial rights, apply to C B. HUTCHINSON & CO., Syracuse, N. Y. 36tf

J. D. WHITE'S PATENT CAR AXLE LATHES —also Patent Engine Screw Lathes, for boring and turning tapers, cutting screws, &c. We manufacture and keep constantly on hand the above lathes; also double slide Chuck and common Hand Lathes, Iron Planers, 8 Ingersoll's Patent Universal Ratchet Drill, &c. Weight of Axle Lathe, 5,500 lbs; price $600; Engine Screw Lathe, 1400 to 7,000 lbs; price $225 to $675,

27tf BROWN & WHITE, Windsor Locks, Conn.

COCHRAN'S CRUSHING MACHINE—Can be seen in daily operation in Thirteenth street, between 9th and 10th avenues. Parties in want of a machine for crushing and pulverising quickly and cheaply Quartz Rock, Iron, Lead, Copper, and Silver Ores, and other mineral substances equally hard, are invited to witness the operation of these powerful and simple, but yet effective machines. For further particulars apply to E. & J. BUSSING & CO., No. 52 Cliff st., Y. N. 35tf

THE NEW HAVEN MANUFACTURING CO. No. 2 Howard st. New Haven, Ct., are now finishing 6 large Lathes, for turning driving wheels, and all kinds of large work; these lathes weigh 9 tons, and swing 7 1-3 feet, shears about 16 feet long. Cuts and further particulars can be had by addressing as above, post-paid, or to S. C. Hills, agent N.H. M. Co., 12 Platt st, N. Y. 28tf

LEE & LEAVITT—Manufacturers of every description of Cast Steel Saws, No 53 Water street, between Walnut and Vine, Cincinnati, O. 27 6m*

SCIENTIFIC MUSEUM.

To Test the Purity of Water.

Water, in a state of purity, can only be obtained by distillation, or as it falls in the form of rain. From its being able to hold, in solution, so great a variety of substances, it is almost always contaminated with some of them. Spring water becomes impregnated with the various earthy matters through which it runs; and river water is still more impure, in consequence of many foreign substances that find their way into it. For chemical purposes, where it is essential that the water should be quite pure, it is necessary, therefore, to distil it, by which means the impurities are separated from it. In order to ascertain the general properties of any kind of water, it may be tested in the following manner:—

Pour a small quantity of it into a wine-glass, and dip into it a slip of litmus paper, when, if an acid is contained in the liquid in any quantity, the paper will become red; if the water contains an alkali, the test-paper will become green.

The presence of earthy matter may be ascertained by mixing a little soap with water; if much earthy matter is in it, the soap will be curded. This is the reason why it is impossible to form soap-suds with hard spring-water.

Evaporate a drop of the water to be tested from a watch glass. Small rings will appear if it contained only a small portion of impure water; but a crust is seen if it held, in solution, much saline or earthy matter, and the crust has an ochry tint, if iron be present.

Electric Gas.

This is gas produced from water by means of electricity, and by which is developed, for the first time, the extraordinary phenomenon of burning the two gases together, without the least fear of explosion, which the most scientific and learned men have ever hitherto deemed an impracticability. But we have witnessed the result, and can attest its truth. The gases produced by electricity are entirely free from smoke, have no deleterious noxious odor, and are free from all possibility of explosion; each of which advantages are of so important a character as to be alone sufficient to insure public support. Its production requires no expensive materials, nor are large premises necessary, whilst all existing pipes and lamps may be used if requisite; and in the economy of production there will be a saving of at least fifty per cent. upon the present cost of coal gas.—[Mining Journal.

[The above is all fudge. The gases spoken of are oxygen and hydrogen; they can be burned and no explosion produced. The author of the above surely never heard of such an instrument as the "oxy-hydrogen blow-pipe." Electric lights appear to be unkillable; no sooner is one slain in one part of the world than another springs into existence amongst the green ones in another part of the world.

Navigation of the Amazon.

An enterprize is in progress in New York, by an eastern gentleman, under the auspices of the Peruvian Government, having in view the permanent establishment of a system of navigation on the South American river Amazon—the largest river on the globe. Messrs. Lawrence & Foulkes are constructing the pioneer steamers, two in number.

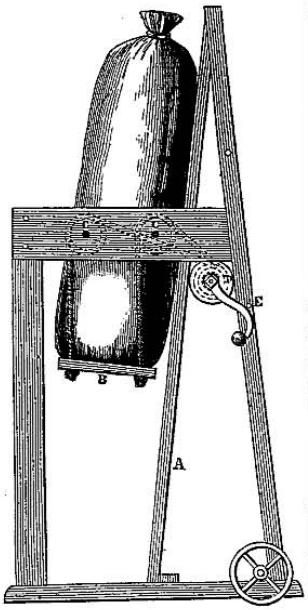
Canary Birds and Canary Seed.

The "Boston Atlas" having mentioned that during last year 56,000 bushels of canary seed were imported, costing $13,500, a writer in the Journal of Commerce adds the intelligence that 41,000 canary birds are annually imported, costing $17,360, making a total of nearly $31,000 for birds and their food.

Destructive Insects.

A correspondent of the Boston Transcript, M. H. Simpson, of Saxonville, writes to that paper that he has discovered a new worm upon the apple, cherry, and plum trees, eating the leaves and fruit. It is very destructive to the tender shoots as well as the fruit, and the writer says that if all the worms go through their transformations, the next generation will be in such swarms as to destroy the trees. If the trees be shaken, the worms spin a fine fibre towards the ground, and remain suspended by it, ascending again afterwards to commence anew their ravages.—They are described as having three longitudinal stripes on the back; the centre is fainter than the other two; and the head is buff colored and heart shaped. These destructive insects are spreading through Massachusetts. Already they have had two generations this season. As a means of destroying them, Mr. Simpson recommends the syringing of the trees with whale oil soap when the worm is first hatched.

Sack Elevator.



This simple apparatus effects an important saving of human labor in warehouses and other situations, where heavy sacks have to be raised from the ground, and conveyed away on men's shoulders. It is in the lifting operation that the carrier's power is so rapidly consumed—the loss due to this operation, especially for short distances of conveyance, being about two-thirds of the whole force called into action. The engraving represents a side elevation of the "sack elevator," as having just raised up its load. It consists merely of a timber frame, open at the front to admit the sack, which is placed against the inclined frame, A, and upon the lift-board, B, suspended by four ropes from its four corners. These ropes pass over fixed pulleys, C, in the upper cross-bars of the frame, and are thence passed round corresponding pulleys, D, on a short horizontal shaft at the back of the frame. When a sack is to be raised, the board, B, rests on the floor, and the sack being set upon it, the attendant turns the winch-handle on the back pulley shaft, and thus with ease winds up the four supporting cords, and raises the sack to the required height, when it is held in the desired position by a movable stop-pin, E, which holds the handle. This mode of elevating sacks to relieve carriers, was designed by T. M. Sharp, of Belfast, Ireland, and first appeared in the "Mechanic's Journal." In many places and cases it may be of great use, especially where only one man is employed, but the plan is slow, and will not pay for the waste of time, unless the sacks are very heavy and the carrier unable to lift one to the proper position for carrying on his back. A man will carry a heavier weight on his back than he can lift up to it from the ground, hence it is necessary to place a heavy bag on an elevation to lift it for carrying; this apparatus obviates the necessity of requiring extraneous help to lift a heavy bag, or of having it lifted and placed first on an elevation nearly as high as the breast, to place it properly on the back so as to carry it well to the required distance.

In some parts of South Carolina we perceive that the thermometer has been as high as 106 degrees in the shade.

Amount of Water Evaporated by different kinds of Fuel.

As we have had two or three communications within a few weeks making enquiries respecting the amount of water evaporable by a given amount of fuel, we present the following as the results of the experiments of Dr. Dalton, and other competent authorities:

One lb. of hydrogen, burnt with 7 lbs. oxygen, produces 8 lbs. of water, and raises 250 lbs. of water 180°.		lbs.
Charcoal	2·8 3·8 carbon. acid,	31
Oil, wax, tallow	3.5 4·5 water & carb ac.,	81
Oil of turpentine		46·4
Carb. hydrogen	4· 5· water & carb. ac.,	66
Olefiant gas	3·5 4·5 water & carb. ac.,	67
Naphtha	3·20	73
Rape oil		90
Caking coal		54
Olive oil		76
Charcoal		57
Coke		51
Peat		22
Newcastle coal		55·5
Culm		11

The numbers in the last column represent the number of pounds of water at 32°, which will be heated to 212°, when the fuel is applied in the most economical manner; and hence the quantity of fuel to heat any other quantity of water any number of degrees, can be found by the common arithmetical rules of proportion.

The quantity of water at 212°, which will be converted into steam, may be found, by dividing the number of pounds of water in the table by 5.55. Thus, from the table—1 lb of Newcastle coal gives 180° to 55·5 lbs. of water.

Therefore, 1 lb. of Newcastle coal converts into steam, 55·5÷5·55=10 lbs. of water.

This is to be taken as the effect that may be produced if there be no material loss of heat.

Relative Purity of Different Descriptions of Artificial Light.

Prof. Frankland, of Manchester, has given the following statement as the accurate results of his important investigations as to the comparative purity of different descriptions of artificial light, as taken from a lecture recently delivered by him in the Royal Institution of Great Britain.

Quantity of carbonic acid and heat generated per hour, by various sources of light equal to twenty sperm candles:—

	Carbonic acid. Cubic feet	Heat
Tallow,	10·1	100
Wax,	8·3	82
Spermaceti,	8·3	82
Sperm oil (Carcel's lamp)	6·4	63
London gases (coal)	5·0	47
Manchester gas	4·0	32
London gas (Cannel)	3·0	32
Boghead hydro-carbon gas	2·6	19
Lesmahago hydro-carbon gas	2 5	19

Prof. Frankland adds:—"The two objections most frequently advanced against the use of gas in dwelling houses are the deterioration of the air by the production of corbonic acid, and the evolution of so much heat as to render the atmosphere oppresively hot. It will be seen from the comparison exhibited that in these respects even the worst descriptions of coal gas are, for an equal amount of light, superior to all other illuminating materials; whilst, with the better descriptions of gas, three or four times the amount of light may be employed with no greater atmospheric deterioration."

Habits of Bees.

At a meeting of the London Entomological Society, Mr. Westwood mentioned some curious circumstances which had lately occurred in his apiary. "About ten days ago one of the hives threw off a swarm which settled in the front of the bee-house, and stopped the entrance to the next hive, the inhabitants of which at once commenced fighting the invaders. Mr. Westwood then sought for and removed the queen, and having released her she led the swarm to the entrance of another hive, where a second battle began. The queen being again removed—this time to a rose bush—she flew away, and the swarm returned to the hive whence it had come. Yesterday a different hive gave forth a swarm which settled with and joined a swarm from another hive, much fighting ensued, but today all was quiet, whence it might might be presumed that one of the queens had been killed. Mr. Waring knew an instance in which four swarms had united, and the hive had to be enlarged, being too small to hold the bees."

Boiler Making.

In passing the extensive works of Messrs. Cameron, Mustard, & Co., we noticed a very large and massive boiler which they had just turned out, and were removing to the wharf for the purpose of placing it on board the favorite steamer Nina, for which it was constructed. It is 22 feet long, 9 feet diameter, weighs about sixteen tons, and will generate ample steam for a 150 horse power engine. Its workmanship is of the most superior description, and for faithfulness of construction and neatness of finish, it will challenge comparison with any similar production from any establishment in the United States.

In the shop of Mr. Lebby, in the same neighborhood, we noticed also a large boiler, which he has nearly completed for the steamer William Seabrook. It is of the wagon shape, 20 feet long, 12 feet high, and nine feet wide, and is of about 100 horse power. This is the eighteenth boiler of this description which Mr. Lebby has constructed, and all, upon trial, have given the most ample satisfaction.—[Charleston (S. C.) Mercury.

LITERARY NOTICES.

The Works of Shakspeare—Re-printed from the newly-discovered copy of the folio of 1632, containing nearly twenty-thousand manuscript corrections, with a "History of the Stage," by J. Payne Collier. Parts 4 and 5 are now ready of this valuable series. Those wishing a correct edition of Shakspeare should not fail to procure this copy. Redfield, New York, publisher; sold by booksellers generally.

The Illustrated Catalogue of the Exhibition—The first two numbers (a double one), of the Illustrated Catalogue of the Exhibition, by G. P. Putnam, was published on the day the Exhibition opened. It is illustrated with a number of engravings, mostly works belonging to the fine arts, the cuts of many being badly executed: there is a stiffness and blurred appearance about them which is not at all creditable to those who have charge of the work; there is certainly great room for improvement in both the drawing and engravings.

Bibliotheca Sacra—The number for July of this famous religious classical work contains nine elaborate articles on various subjects of great interest: one on the "Religion of Geology," by the Rev. J. T. Dana, of South Adams, Mass., we would recommend to all believers of the Bible who look upon Geology as a science with distrust. Published by W. F. Draper & Brother, Andover, Mass.

Gavazzi's Lectures and Life—The enterprizing publishing firm of Dewitt & Davenport, 160 and 162 Nassau street have just issued in handsome style the "Life and Lectures" of the celebrated Gavazzi. The work was authorized by Gavazzi himself, therefore it may be relied upon as authentic.

MECHANICS

Manufacturers and Inventors.

A new Volume of the SCIENTIFIC AMERICAN commences about the middle of September in each year. It is a journal of Scientific, Mechanical, and other improvements; the advocate of industry in all its various branches. It is published weekly in a form suitable for binding, and constitutes, at the end of each year, a splendid volume of over 400 pages, with a copious index, and from five to six hundred original engravings, together with a great amount of practical information concerning the progress of invention and discovery throughout the world.

The Scientific American is the most widely circulated and popular journal of the kind now published. Its Editors, Contributors, and Correspondents are among the ablest practical scientific men in the world.

The Patent Claims are published weekly and are invaluable to Inventors and Patentees.

We particularly warn the public against paying money to Travelling Agents, as we are not in the habit of furnishing certificates of agency to any one.

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